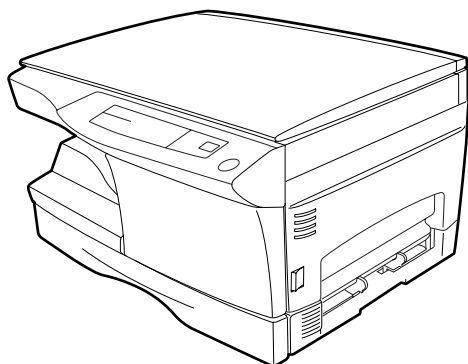


SHARP SERVICE MANUAL

CODE: 00ZAR151E/A1E

DIGITAL COPIER



MODEL AR-121E AR-151E

* This Service Manual describes only the differences from the AR-120E/150E. For the common items with the AR-120E/150E, please refer to the AR-120E/150E manual.



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[3] SIMULATIONS	3 - 1
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Parts marked with "△" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

[1] GENERAL

The AR-121E/151E is the SRU model of the AR-120E/150E.

While the AR-120E/150E employs the drum replacement, the AR-121E/151E employs the developer replacement. Therefore, the display on the operation panel is changed from “” (drum) to “” (developer) accordingly.

1. Major functions

Item Model	CPM	SB/MB	2 Tray	SPF	R-SPF	FAX	GDI with USB	GDI without USB	PCL with USB	SOPM	Duplex
AR-121E	12CPM	SB	×	×	×	×	×	Opt	×	×	×
AR-151E	15CPM	SB	×	×	×	×	×	Opt	×	○	×

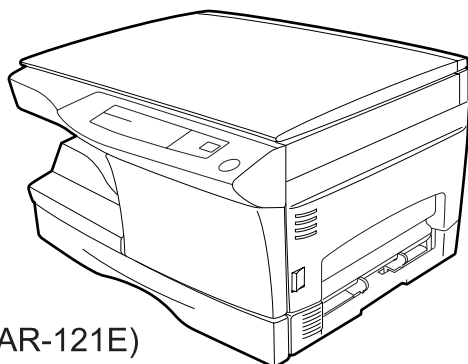
Descriptions of items

CPM:	Copy speed (Copies Per Minute)
SB/MB:	SB = Manual feed single bypass, MB = Manual feed multi bypass
2 tray:	Second cassette unit.
SPF:	Original feed unit
R-SPF:	Duplex original feed unit
FAX:	FAX function.
GDI with USB:	GDI printer function with USB.
GDI without USB:	GDI printer function without USB.
PCL with USB:	PCL printer function with USB.
SOPM:	Scan Once Print Many function (Many copies are made by one scan.)
Duplex:	Auto duplex copy function

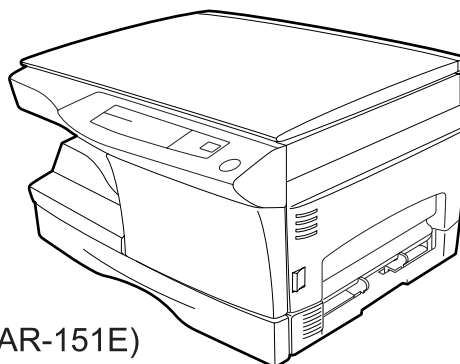
Descriptions of table

- : Standard provision
 - ×
- ×

2. System Configuration

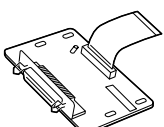
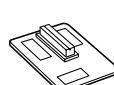

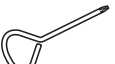

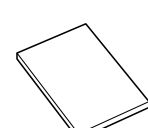
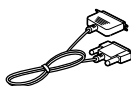


(AR-121E)



(AR-151E)

Options (AL-10PK/AL-11PK)

Printer board ... 1 	Memory ... 1 * 	Printer driver (CD-ROM) ... 1 	Screwdriver ... 1 
Screws ... 4 	Operation manual ... 1 	Interface cable ... 1 (for IBM PC/AT or compatible computers) 	

* AR-150E, the memory has been already installed in the machine and is not supplied in the printer upgrade kit(AL-10PK).

[2] CONSUMABLE PARTS

1. Supply system table

A. Europe subsidiaries/East Europe/SCA/SCNZ

No.	Name	Content	Life	Product name	Package	Remark
1	Toner CA(Black) with IC	Toner × 10 (Toner :Net Weight 210g) Polyethylene bag × 10	72K	AR-152LT	1	LT=T*10
2	Developer	Developer × 10 (Developer :Net Weight 170g)	250K	AR-152LD	1	LD=DV*10
3	Drum kit	Drum × 1 Drum fixing plate × 1	25K	AR-152DM	10	

Note: Printing of the master/individual cartons is made in 4 languages, English/French/German/Spanish.
Packed together with the machine: DR 25K/Developer UN/Process UN

B. SMEF (Middle East, Africa) Israel/Russia/CIS/Taiwan/Philippines

No.	Name	Content	Life	Product name	Package	Remark
1	Toner CA(Black) with IC	Toner × 10 (Toner :Net Weight 210g) Polyethylene bag × 10	72K	AR-152ET	1	* Life setup is based on A4 6%. ET=FT*10
2	Developer	Developer × 10 (Developer :Net Weight 170g)	250K	AR-152CD	1	CD=SD*10
3	Drum kit	Drum × 1 Drum fixing plate × 1	25K	AR-152DR	10	

Note: Printing of the master/individual cartons is made in 4 languages, English/French/German/Spanish.
Packed together with the machine: DR 25K/Developer UN/Process UN

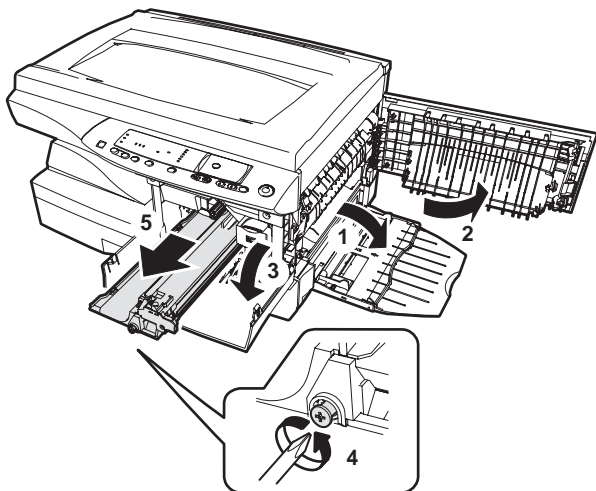
C. Asia (Subsidiary)

No.	Name	Content	Life	Product name	Package	Remark
1	Toner CA(Black) with IC	Toner × 10 (Toner :Net Weight 210g) Polyethylene bag × 10	72K	AR-152CT	1	* Life setup is based on A4 6%. CT=ST*10
2	Developer	Developer × 10 (Developer :Net Weight 170g)	250K	AR-152CD	1	CD=SD*10
3	Drum kit	Drum × 1 Drum fixing plate × 1	25K	AR-152DR	10	

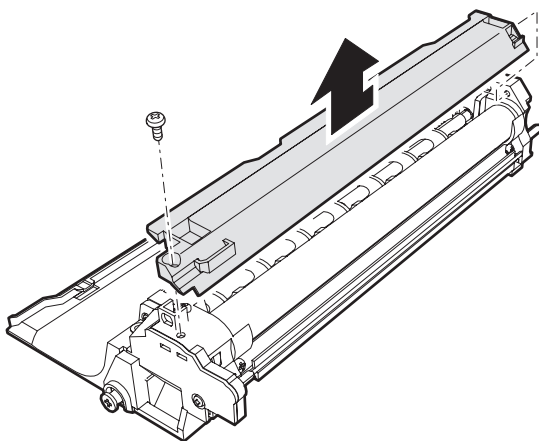
Note: Printing of the master/individual cartons is made in 4 languages, English/French/German/Spanish.
Packed together with the machine: DR 25K/Developer UN/Process UN

2. Developer unit installation

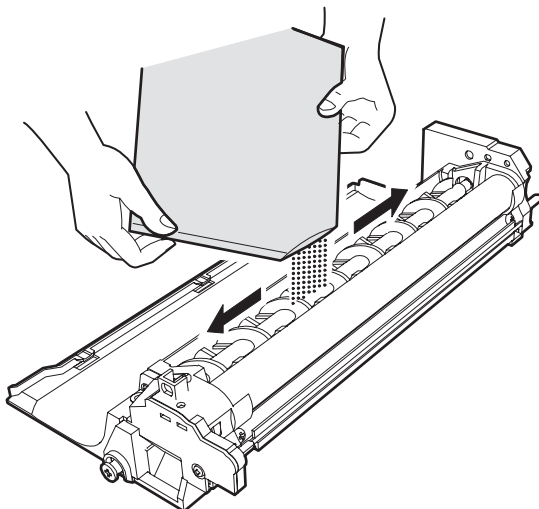
- 1) 2) 3) Open the side and front cabinets of the copier.
- 4) Remove the locking tape of the developer unit.
- 5) Remove the screw which is fixing the copier and Developer unit.
- 6) Remove Developer unit slowly from the copier.



- 7) Remove the screw (1 pc).
- 8) Remove Upper developer unit.

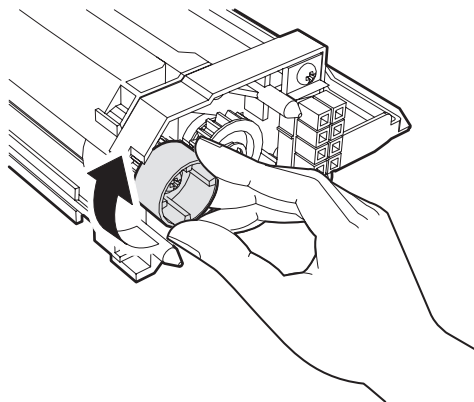


- 9) Shake the aluminum bag to stir developer
- 10) Supply developer from the aluminum bag to the top of the MX roller evenly.



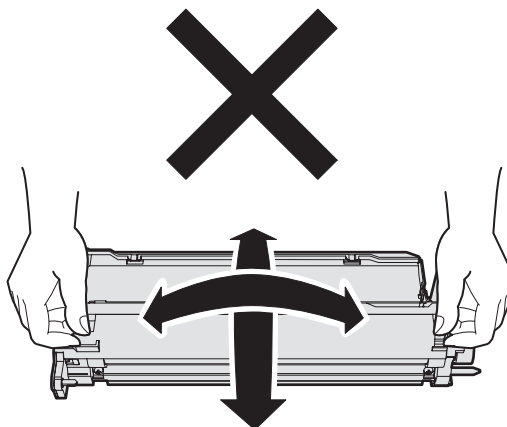
Note: Be careful not to splash developer outside Developer unit.

- 11) Attach Upper developer unit and fix it with a screw.
- 12) Rotate the MG roller gear to distribute developer evenly.



Note: Never rotate the gear in the reverse direction.

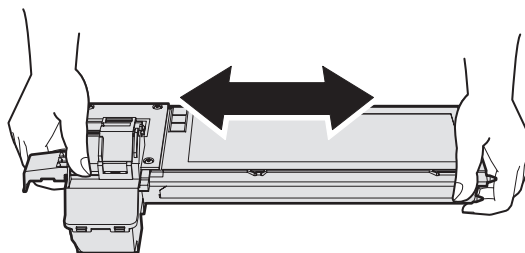
Note: When carrying Developer unit, do not tilt it extremely as shown with the arrow in the figure below.
(Prevention of splash of developer)



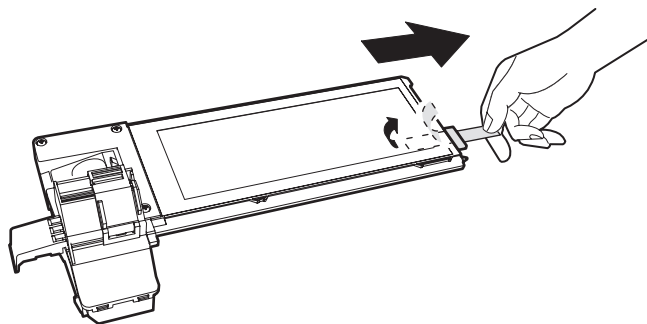
- 13) Insert Developer unit carefully into the copier.
Note: Quick insertion may result in splash of developer. Be sure to insert carefully.
- 14) Confirm that Developer unit is completely inserted to the bottom of the machine, fix Developer unit and the machine with a screw.
- 15) Completion of Developer unit installation

3. Toner cartridge installation

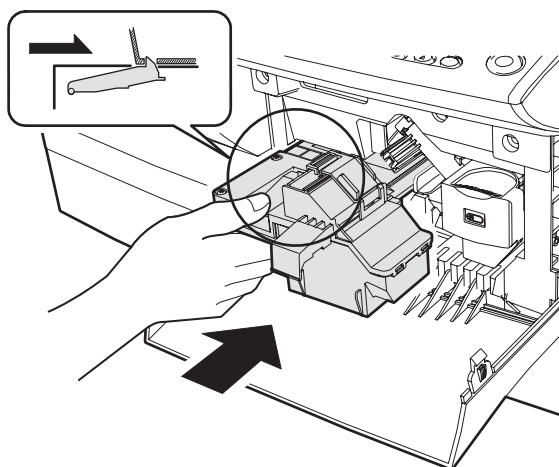
- 1) To prevent against uneven distribution of toner, hold Toner unit with both hands and shake it several times horizontally.



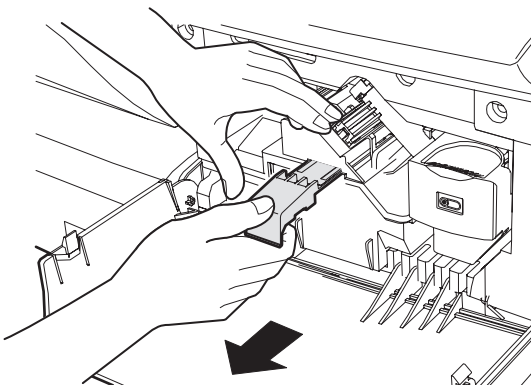
- 2) Hold the section of Toner unit shown in the figure below, remove the packing tape, and remove the cushion.
- 3) Pull out the cushion in the arrow direction.



- 4) Insert Toner unit carefully into the copier.
- 5) Insert until the hook is engaged with the copier as shown in the figure below.



- 6) Pull out the shutter in the arrow direction.

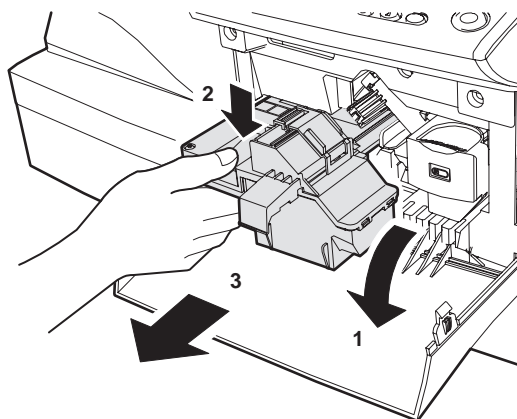


Note: Do not hold and carry the shutter. Otherwise the shutter may drop and Toner unit may drop.

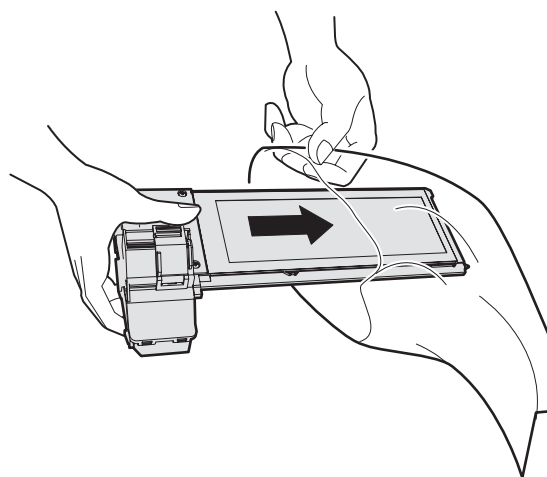
- 7) Completion of Toner unit installation
Close the front and side cabinets.

4. TD cartridge replacement

- 1) Open the front and side cabinets of the copier.
- 2) Keep holding Toner lever, and
- 3) Carefully pull out Toner unit from the copier.



- 4) Put Toner unit in a collection bag immediately after removing it from the copier



Note: Never carry exposed Toner unit. Be sure to put it in the collection bag.

[3] SIMULATIONS

1. List of simulations

The table below shows the simulations which are not provided for the AR-120E/150E but newly added to the AR-121E/151E.
Simulation 26-38 of the SR-120E/150E is deleted in the AR-121E/151E.

Main code		Sub code	Contents
24	Special counter clear	06	Developer counter clear
26	Various setup	37 55	Cancel of stop at developer over CRUM destination display
46	Exposure adjustment	19	γ Table adjustment (Copy mode)

2. Contents of simulations

Main code	Sub code	Content										
24	06	Developer counter clear When the PRINT switch is pressed, the developer count value is reset to 0.										
26	37	Cancel of stop at developer life over When this simulation is executed, the current set code is displayed. Enter a new code and press the PRINT switch, and the entered code is registered. <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>0</td><td>Stop at developer life over</td></tr><tr><td>1</td><td>Stop cancel at developer life over</td></tr></table>	Code number	Setting	0	Stop at developer life over	1	Stop cancel at developer life over				
Code number	Setting											
0	Stop at developer life over											
1	Stop cancel at developer life over											
	55	CRUM destination display When this simulation is executed, the current setup of the CRUM destination stored in the machine is displayed. <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>00</td><td>No setup</td></tr><tr><td>01</td><td>BTA-A</td></tr><tr><td>02</td><td>BTA-B</td></tr><tr><td>03</td><td>BTA-C</td></tr></table>	Code number	Setting	00	No setup	01	BTA-A	02	BTA-B	03	BTA-C
Code number	Setting											
00	No setup											
01	BTA-A											
02	BTA-B											
03	BTA-C											
46	19	γ table setup When this simulation is executed, the currently set gamma table code number is displayed. Enter the code number corresponding to your desired gamma table and press the PRINT switch, and the setup will be changed. <table><tr><th>Code number</th><th>γ table</th></tr><tr><td>1</td><td>Japan</td></tr><tr><td>2</td><td>EX Japan</td></tr></table>	Code number	γ table	1	Japan	2	EX Japan				
Code number	γ table											
1	Japan											
2	EX Japan											

[4] USER PROGRAM

The conditions of factory setting can be changed according to the use conditions.

Functions which can be set with the user program

Function	Contents	Factory setting
Auto clear time	<ul style="list-style-type: none"> When a certain time is passed after completion of copying, this function returns to the initial state automatically. The time to reach the initial state can be set in the range of 30 sec to 120 sec by the unit of 30 sec. This function can be disabled. 	60 sec
Preheat	<ul style="list-style-type: none"> When the copier is left unused with the power ON, the power consumption is automatically reduced to about 40Wh/H (* Note). The time to start this function can be set in the range of 30 sec to 90 sec by the unit of 30 sec. This function cannot be disabled. When this function is operated, the pre-heat lamp on the operation panel lights up. To return to the initial state, press any key on the operation panel. (When the COPY button is pressed, a copy is made after returning to the initial state.) 	90 sec
Auto shut off timer	<ul style="list-style-type: none"> When the copier is left unused with the power ON, the power consumption is automatically reduced to about 18Wh/H (* Note). The time to start this function can be set in the range of 2 min to 120 min. When this function is operated, all the lamps except for the pre-heat lamp on the operation panel turn off. To return to the initial state, press the COPY button. 	5 min
Stream feeding	Only models with SPF.	Cancel
Auto shut off	<ul style="list-style-type: none"> Used to set or cancel this function. 	Set

*Note: The power consumption values in preheat and auto shut off may be varied depending on the use conditions.

Setting the power save modes, auto clear time, and stream feeding mode

- Press and hold down the light (☐) and dark (●) keys simultaneously for more than 5 seconds until all the alarm indicators (☼, ☼, ☼, ☼ and ☼) blink and "- -" appears in the display.
- Use the left copy quantity (▲) key to select a user program number (1: auto clear time, 2: preheat mode, 3: auto power shut-off timer, 4: stream feeding mode, 5: auto power shut-off mode). The selected number will blink in the left side of the display.

Function name	Function code
Auto clear time	1
Preheat	2
Auto shut off timer	3
Stream feeding	4*
Auto shut off	5

[Cancel] If a wrong code is entered, press the clear key and enter the correct function code.

* SPF only

* The remaining toner quantity is displayed by pressing the % key for 5 sec before entering a program code in the user simulation mode.

- Press the print (Ⓢ) key. The entered program number will be steadily lit and the currently selected parameter number for the program will blink on the right side of the display.
- Select the desired parameter using the right copy quantity (▲) key. The entered parameter number will blink on the right of the display.

Function name	Set code	Function name	Set code	Function name	Set code	Function name	Set code	Function name	Set code
Auto clear time	0 (Cancel)	Preheat	0 (30 sec)	Auto shut off timer	0 (2 min)	Stream feeding	*0 (Cancel)	Auto shut off	0 (Cancel)
	1 (30 sec)		1 (60 sec)		*1 (5 min)		1 (Setting)		*1 (Setting)
	*2 (60 sec)		*2 (90 sec)		2 (15 min)				
	3 (90 sec)				3 (30 min)				
	4 (120 sec)				4 (60 min)				
	5 (10 sec)				5 (120 min)				

* : Factory setting

- Press the print (Ⓢ) key. The right-hand number in the display will be steadily lit and the entered value will be stored.

Note: To change the setting or to set another mode, press the clear (Ⓢ) key. The copier will return to step 2).

- Press the light (☐) or dark (●) key to return to the normal copy mode.

[5] MAINTENANCE

1. Maintenance table

X: Check (Clean, adjust, or replace when required.) ○ : Clean ▲: Replace △ : Adjust ☆: Lubricate

Section	Parts	25K	50K	75K	100K	125	Remark
Developing	Developer	▲	▲	▲	▲	▲	
	DV blade	○	▲	○	▲	○	
	DV side seal (F/R)	○	▲	○	▲	○	
Process peripheral	Drum	▲	▲	▲	▲	▲	

2. Maintenance display system

Toner	Life	7.2K	
	Remaining quantity check *1	a. Press and hold the density adjustment LIGHT key for more than 5 sec, and the machine will enter the user program mode. b. Press and hold the "%" key for more than 5 sec, and the remaining quantity will be displayed on the copy quantity display in one of the following levels: (Remaining quantity display levels: 100%, 75%, 50%, 25%, 10%, LO) c. Press the density adjustment LIGHT key to cancel.	
	Remaining quantity	NEAR EMPTY About 10%	EMPTY
	LED	ON	Flash
	Machine	Operation allowed	Stop
Developer	Life	25K	
	LED	ON at 25K of the developer count.	
	Machine	Selection is available between Not Stop and Stop by Service Simulation (SIM 26-37) Setup. (If Stop is selected, the LED will flash and stop at 25K.) * Default: Not Stop * Clear: SIM 24-06	
Maintenance	LED	Selection is available among 18K, 13K, 9K, 6K, 3K, and free (no lighting) with SIM 21-1. * Default: free * Clear: SIM 20-1	
	Machine	Not stop.	

*1: Installation of a new toner cartridge allows to display the remaining quantity.

SHARP

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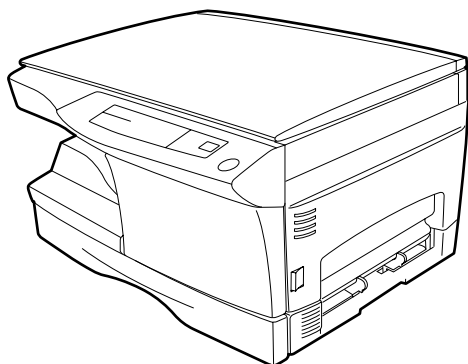
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2001 January Printed in Japan (N)

SHARP SERVICE MANUAL

CODE: 00ZAR150E/A2E

DIGITAL COPIER



AR-120E
MODEL AR-150E

* This Service Manual describes only the differences from the AL-1000. For the common items with the AL-1000, please refer to the AL-1000 manual.

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[1] GENERAL	1 - 1
[2] SPECIFICATIONS	2 - 1
[3] CONSUMABLE PARTS	3 - 1
[4] SIMULATIONS	4 - 1
● PARTS GUIDE	

Parts marked with “△” are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

[1] GENERAL

1. Major functions

Item Model	CPM	SB/MB	2 Tray	SPF	R-SPF	FAX	GDI with USB	GDI without USB	PCL with USB	SOPM	Duplex
AR-120E	12CPM	SB	×	×	×	×	×	Opt	×	×	×
AR-150E	15CPM	SB	×	×	×	×	×	Opt	×	○	×

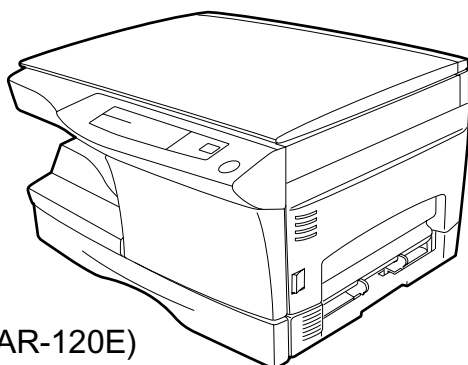
Descriptions of items

CPM:	Copy speed (Copies Per Minute)
SB/MB:	SB = Manual feed single bypass, MB = Manual feed multi bypass
2 tray:	Second cassette unit.
SPF:	Original feed unit
R-SPF:	Duplex original feed unit
FAX:	FAX function.
GDI with USB:	GDI printer function with USB.
GDI without USB:	GDI printer function without USB.
PCL with USB:	PCL printer function with USB.
SOPM:	Scan Once Print Many function (Many copies are made by one scan.)
Duplex:	Auto duplex copy function

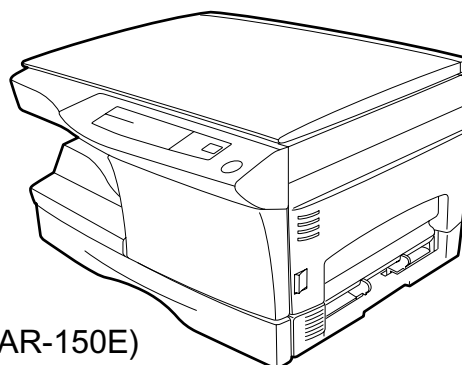
Descriptions of table

- : Standard provision
 × : No function or no option available

2. System Configuration

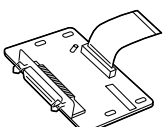
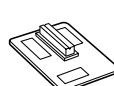



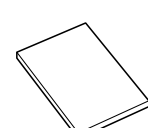
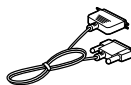


(AR-120E)



(AR-150E)

Options (AL-10PK/AL-11PK)

Printer board ... 1 	Memory ... 1 * 	Printer driver (CD-ROM) ... 1 	Screwdriver ... 1 
Screws ... 4 	Operation manual ... 1 	Interface cable ... 1 (for IBM PC/AT or compatible computers) 	

* AR-150E, the memory has been already installed in the machine and is not supplied in the printer upgrade kit(AL-10PK).

[2] SPECIFICATIONS

1. Copy mode

A. Type

Type	Desk-top
------	----------

B. Machine composition

AR-120E	12 cpm / 1 tray / SB
AR-150E	15 cpm / 1 tray / SB / SOPM

(1) Option

Machine	Model	Power supply
GDI printer expansion kit	AL-10PK (for AR-150E)	Supplied by the copier.
	AL-11PK (AR-120E)	Supplied by the copier.

C. Copy speed

(1) Continuous copy speed (Sheets/min)

a. AR-120E

Paper size		Normal	Enlargement (200%)	Reduction (50%)
AB system	A4	12	12	11
	B5	12	12	12
Inch system	8.5" × 14"	10	10	10
	8.5" × 11"	12	12	12

b. AR-150E

Paper size		Normal	Enlargement (200%)	Reduction (50%)
AB system	A4	15	15	15
	B5	15	15	15
Inch system	8.5" × 14"	12	12	12
	8.5" × 11"	15	15	15

D. First copy time

First copy time	9.6 sec
-----------------	---------

E. Document

Max. document size	B4, 10" × 14"
Document reference position	Left side center
Detection (Platen)	None

F. Paper feed

Copy size (Max. ~ Min.)	(A4 ~ A6) 8.5" × 14" ~ 8.5" × 5.5"	
Paper feed system	AR-120E	1 cassette + Single manual paper feed
	AR-150E	

(1) Paper feed section of the copier

Paper feed size	A4, B5, A5, 8.5" × 14", 8.5" × 11", 8.5" × 5.5"
Paper feed capacity	250 sheets (56 ~ 80g/m ² equivalent) (15 ~ 21 lbs.)
Detection	Paper empty detection available
Weight	56 ~ 80g/m ² (15 lbs. ~ 21 lbs.)
Special paper	Recycled paper

(2) Manual paper feed section

Paper feed size	A4 ~ A6, 11" × 17" ~ 8.5" × 5.5"
Paper feed capacity	1 sheets (Single bypass feed tray)
Detection	Size detection not available, paper empty detection available
Weight	52 ~ 128g/m ² (14 ~ 34 lbs.)
Special paper	Recycled paper, OHP film, labels

G. Multi copy

Max. number of multi copy	99 sheets
---------------------------	-----------

H. Warmup time

Warmup time	Approx. 0 sec (Condition: Standard condition)
Pre-heat	Available

I. Copy magnification ratio

Fixed magnification ratio	AB system: 50, 70, 81, 100, 141, 200% Inch system: 50, 64, 78, 100, 129, 200%
Zooming	50 ~ 200%

J. Print density

Density mode	Auto/Manual/Photo
No. of manual adjustment	5 steps (Manual/Photo)

K. Void width

Void area		Lead edge 1 ~ 4mm, rear edge 4mm or less, both sides 4mm or less
Image loss	Leading edge	Same size: 3.0mm or less Enlarge: 1.5mm or less Reduction: 6.0mm or less

L. Auto duplex

Standard/Option	Not installable
-----------------	-----------------

M. Paper exit/finishing

Paper exit section capacity	Face down 100 sheets
-----------------------------	----------------------

N. Additional functions

Auto paper selection (APS)	No
Auto magnification ratio selection	No
Binding margin	No
1 set 2 copy	No
Edge erase	No
Center erase	No
Cover insertion	No
Index paper insertion	No
OHP index paper insertion	No
Job memory	No
Auditor	No
Key operator program	No
Communication conformity	No
Process control	No
Toner save mode	Yes (Time setup/cancel can be made with the user simulation.)
Pre-heat mode	Yes (Time setup can be made with the user simulation.)
Auto power shut off mode	Yes (Time setup/cancel can be made with the user simulation.)

O. Other specifications

Photoconductor type	OPC (Organic Photo Conductor)
Photoconductor drum dia.	30mm
Copy lamp	Xenon lamp
Developing system	Dry 2-component magnetic brush development
Charging system	Saw teeth charging
Transfer system	(+) DC corotron
Separation system	(-) DC corotron
Fusing system	Heat roller
Cleaning system	Contact blade

P. Package form

Body	Body/Accessories
------	------------------

Q. External view

External dimensions (W × D × H)	292.6 × 518 × 445mm
Occupying area (W × D)	607.6 × 445mm (AR-120E/150E)
Weight	about 17.2 kg (AR-120E/150E)

R. Power source

Voltage	AC110V/120V/127V/220V/230V/240V
Frequency	50/60Hz common

S. Power consumption

Max. power consumption	About 1.0KWh
------------------------	--------------

* EnergyStar standard (The second level conformity)

Pre-heat	About 40Wh
Auto power shut off	18wh

T. Digital performance

Resolution	Reading	400 dpi
	Writing	600 dpi
Gradation		256 gradations / 8 bits

U. Maintenance lamp

The maintenance lamp is provided in this model. (Not provided in the AL series)

[3] CONSUMABLE PARTS

1. Supply system table

A. Middle East, Africa

NO	Name	Content	Life	Product name	Package	Remark
1	Developer cartridge (Black) <With IC>	Toner/developer cartridge (Toner 238g, Developer 190g) × 1 IC chip × 1 Polyethene Bag × 1	7.2K	AR-150DC	5	Life setting by A4 6% document
2	Drum cartridge	Drum cartridge × 1 Polyethene Bag × 1	25K	AR-150DM	5	
3	Tonar/developer Kit (Black) <with IC>	Toner bottle (Toner 228g) × 10 Filling Hose × 1 IC chip × 10 Toner cap × 10 Developer bottle (Developer 190g) × 10 DV blade × 10	72K	DM-150LI	1	Life setting by A4 6% document
4	Waste toner box	Waste toner box × 10		AR-150TB	1	
5	Protective cover	MG cover × 10		AR-150MG	1	
6	Drum kit	Drum × 10 Drum fixing plate × 10	250K	AR-150LR	1	
7	Blade kit	Blade × 10 Brush sheet (F/R) Each × 10		AR-150CB	1	
8	Toner kit	Toner bottle (Toner 228g) × 10 Filling Hose × 1 Toner cap × 10	72K	AR-150LT	1	Life setting by A4 6% document

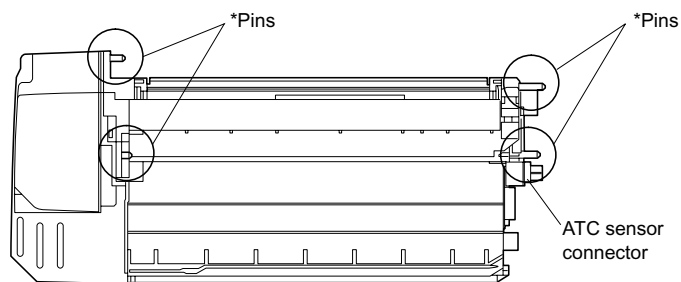
B. LAG (Latin America)

NO	Name	Content	Life	Product name	Package	Remark
1	DV unit	Developer unit × 1	*1	AR-151DW	10	* 1Usable corresponding to 5 times of remanufacturing
2	Drum cartridge	Drum cartridge × 1 Polyethene Bag × 1	25K	AR-151DM	5	
3	Tonar/developer Kit (Black)	Toner bottle (Toner 228g) × 10 Filling Hose × 1 IC chip × 10 Toner cap × 10 Developer bottle (Developer 190g) × 10 DV blade × 10	78K	DM-151LI	1	Life setting by A4 6% document
4	Waste toner box	Waste toner box × 10		AR-150TB	1	
5	Protective cover	MG cover × 10		AR-150MG	1	
6	Drum kit	Drum × 10 Drum fixing plate × 10	250K	AR-150LR	1	AR151LR = AR151RL × 10
7	Blade kit	Blade × 10 Brush sheet (F/R) Each × 10		AR-150CB	1	
8	Toner kit	Toner bottle (Toner 228g) × 10 Filling Hose × 1 Toner cap × 10	78K	AR-150LT	1	Life setting by A4 6% document

2. Consumable parts refill procedure

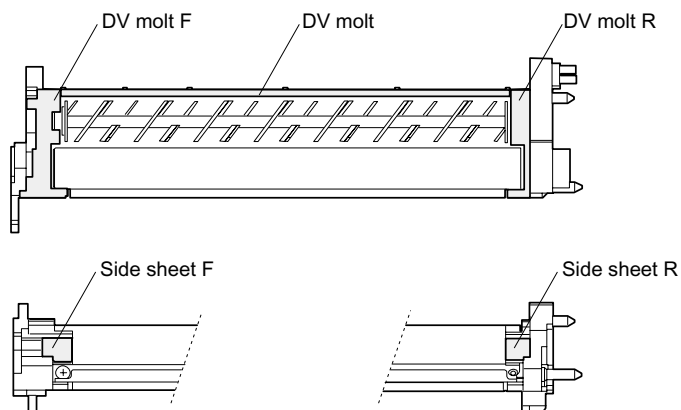
[External view check points]

Check for breakage of the four pins (*) and the ATC sensor connector of the DV BOX unit.



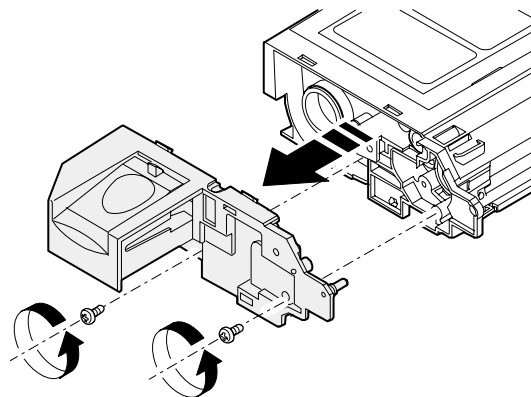
Check for breakage of molt and suede.

(For reattachment, refer to the reattachment procedure.)

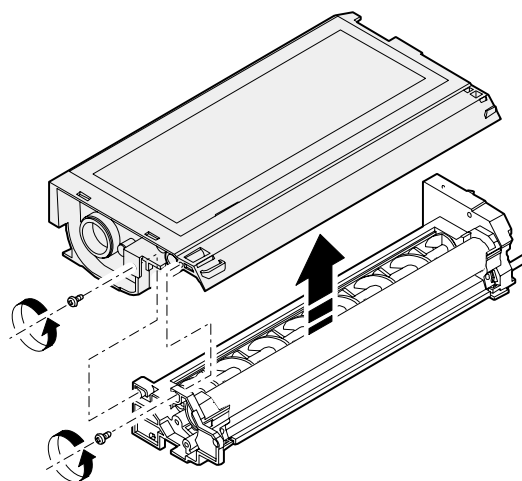


2) Remove the DVF cover unit.

- When removing, be careful not to break the two pins.

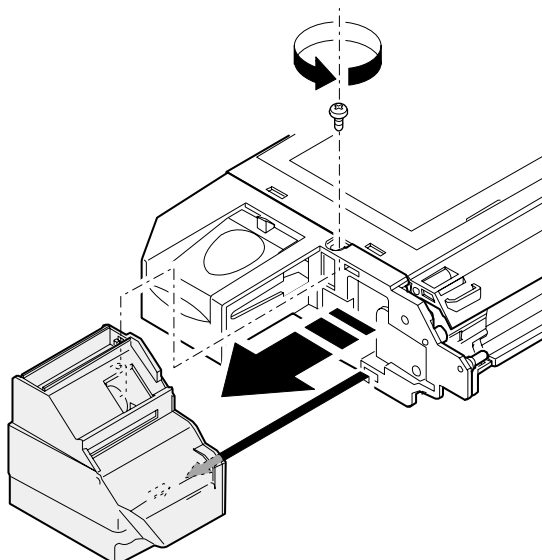


3) Remove the THBOX unit.



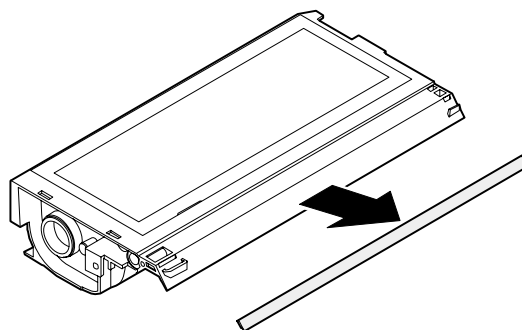
A. TD cartridge

1) Remove the waste toner box unit

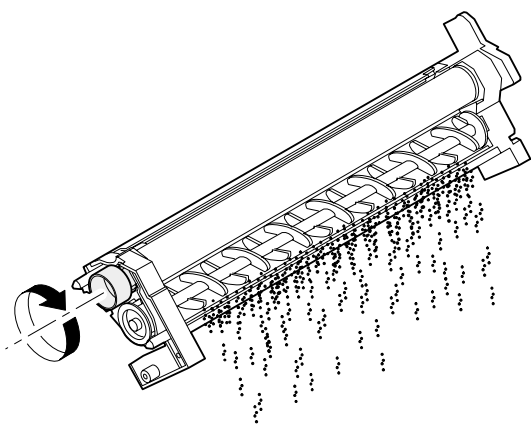


4) Remove the DV blade.

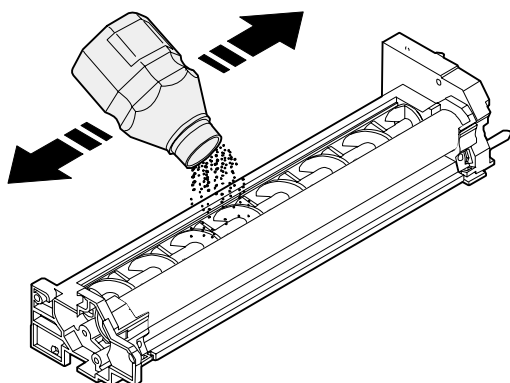
- Remove excessive glue.
- Remove together with the base PET.



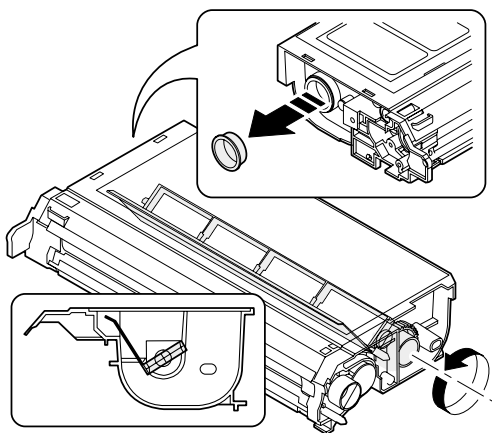
- 5) Tilt the DV box unit and rotate the DV18T clockwise to remove developer.



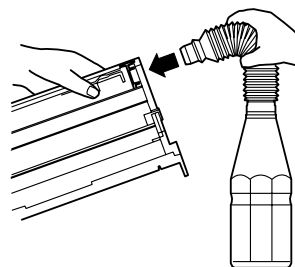
- 6) Clean the DV box unit by sucking or blowing with a vacuum cleaner to remove developer from the MG roller and toner from the DV box unit. Check that there is no toner or no foreign material attached to the connector and the gear.
- 7) Shake the developer bottle 10 times up and down, and remove the bottle cap and supply developer into the DV box unit.
- Slowly slant the bottle to supply developer evenly.
 - Check the label to insure that developer is suitable for the model.



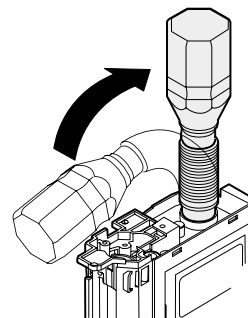
- 8) Install the THBOX unit.
- Insert two bosses of TH box on the drive side into the positioning hole of the DV box and fix together.
- 9) Remove the toner cap, look into the toner supply port and stop the THD Mylar at the position shown in the figure below. (Rotate the THK gear on the rear side of the TH box counterclockwise to rotate the TM shaft.)
- 10) Shake the toner box 20 times up and down, and remove the bottle cap and install the refill hose. Check the label to insure that toner is suitable for the model.



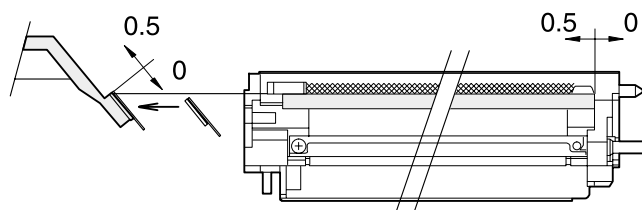
- 11) Face the toner supply port of the TH box unit upward, and press and insert the refill hose into the toner supply port with the toner bottle kept straight up.
- Hold the left side of the TH box with your hand.
 - Press and insert the refill hose completely.



- 12) Lift the toner bottle and shake it left and right and supply toner until the bottle and the filling hose are empty.
- It takes about one minute to fill toner completely in TH BOX UN from lifting the toner bottle to emptying the bottle and the hose.
 - If toner remains in the hose, when removing the hose from TH BOX UN, the remaining toner may disperse. Use great care for that.

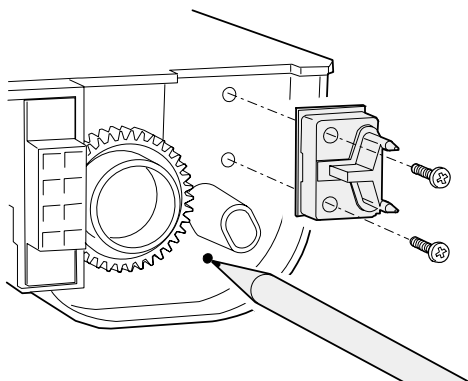


- 13) Check that there is no toner remaining in the bottle and remove the hose, and slowly pull and remove the hose. (If there is any toner remaining in the bottle or the hose, perform toner supply again.)
- Bend the refill hose and remove it from the TH box unit without dispersing toner. Attach the toner cap.
- Attach the toner cap with the toner supply port of the TH box unit faced upward.
- 14) Clean the DV box unit with alcohol and attach the DV blade.
- After drying the unit, attach the DV blade.
 - After attachment, check that there is no scratch and waves on the DV blade.
 - After attachment, be careful not to damage the DV blade.
 - Check that there is no foreign material in the DV blade and the section.



- 15) Install the DVF cover to the DV-TH box unit.
- 16) Clean the waste toner box unit and install it to the DV box unit. (Check that there is no toner in the waste toner box) Be careful of the pawl.

- 17) Replace the IC connector.
Check that there is no oil on the IC connector pins. (Do not touch with fingers.)



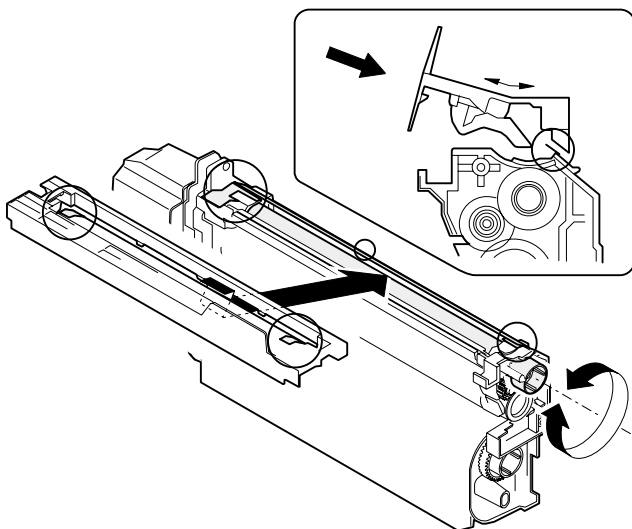
Put a white mark on the above position.

At that time, put marking for checking of the number of refilling.

- 18) Check the operations of the DV lever and the toner box shutter.
19) Shake the DV box unit 5 times horizontally. Rotate the DV18T clockwise and check developer state on the MG roller. (Visually check that developer state is normal and there is no foreign material.)
20) Install the MG cover.

Put the unit straight with the MG roller on the upper side. Rotate the DV18T several times forward and reverse to store developer on the MG roller into the inside. Check that there is no developer on the MG roller surface, and install the MG cover.

Note: When attaching the MG cover, be careful not to wind around the DV blade.



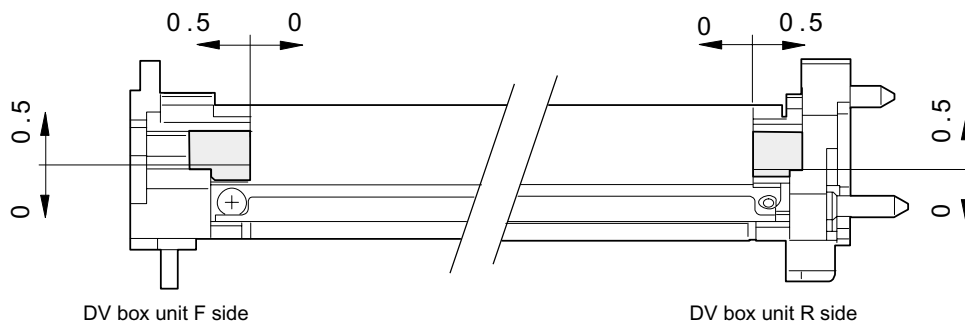
Note for MG cover installation

- When installing, check that there is no breakage and peel-off of the MG cover sheet and the MG cover molt attached to the MG cover.
- Check that there is no winding into the DV blade, deformation and scratches of DV molt F and R.

[The reattachment procedure]

Remove the side sheets on the both sides of DV box unit.

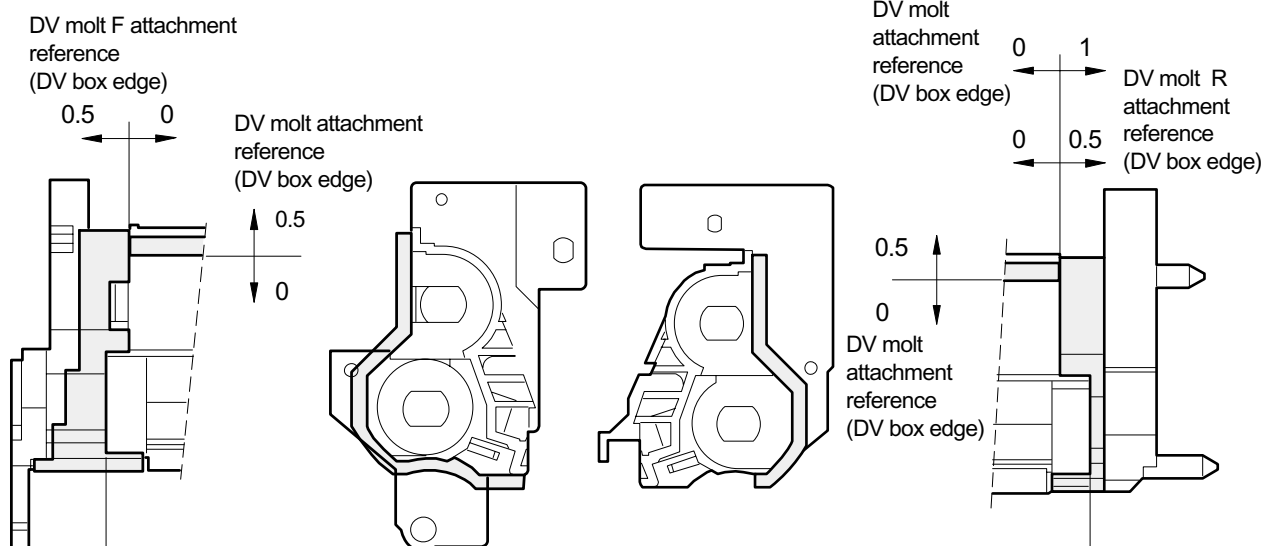
Clean the DV box unit with alcohol and reattach the side sheets F and R to the both sides.



- Remove glue completely before reattaching.
- After drying alcohol, attach the side sheet F,R.

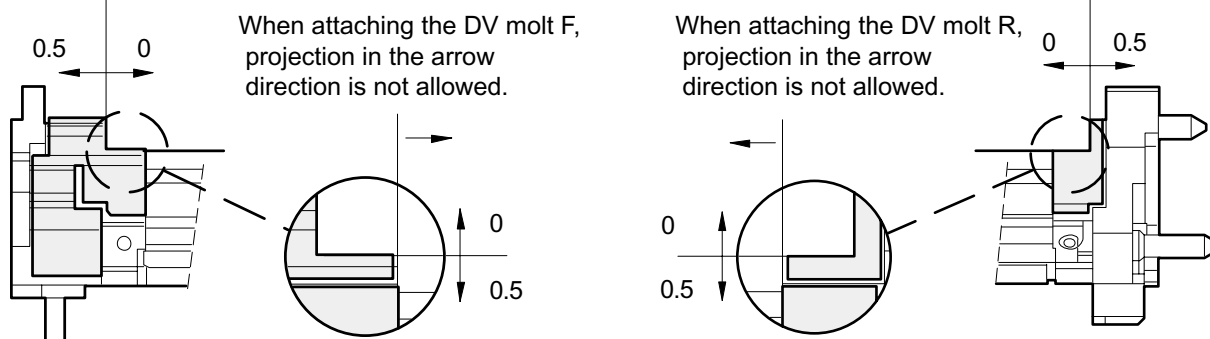
Remove the DV molt F,R and DV molt and clean with alcohol.

After attaching the DV molt F and R, attach the DV molt with the DV molt R edge as the reference.



- Do not allow clearance between DV molt and DV molt F. (Pull and attach them. Overlap may be allowed.)

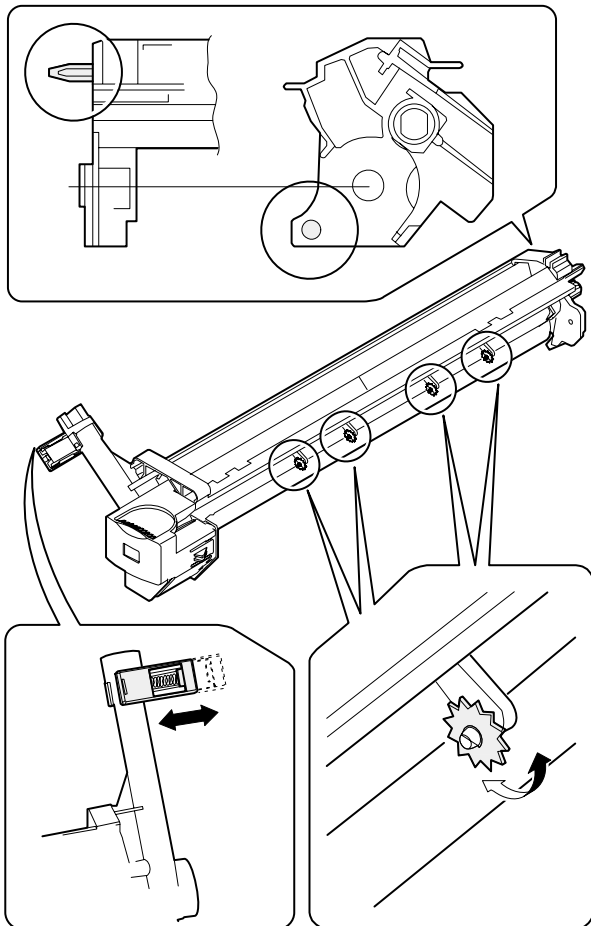
- Remove glue completely before reattaching.
- After drying alcohol, attach the DV side sheet.



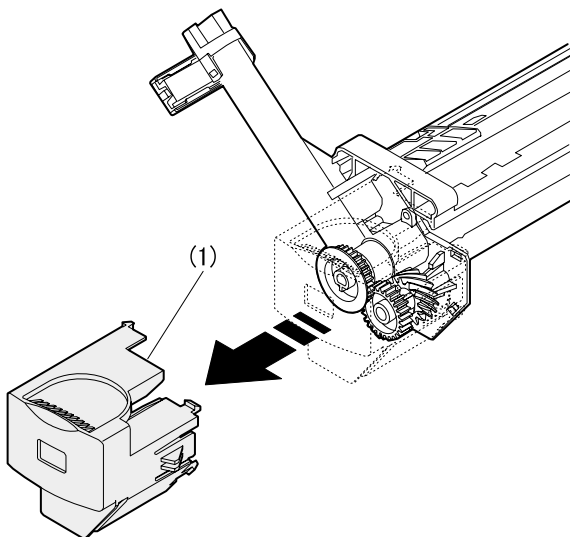
B. Drum unit

1) Check the external view.

- Check for damage or cracks on the boss and the boss hole.
- Check to insure that the waste toner pipe shutter slides smoothly.
- Check to insure that the star ring and the CRU washer rotate smoothly.

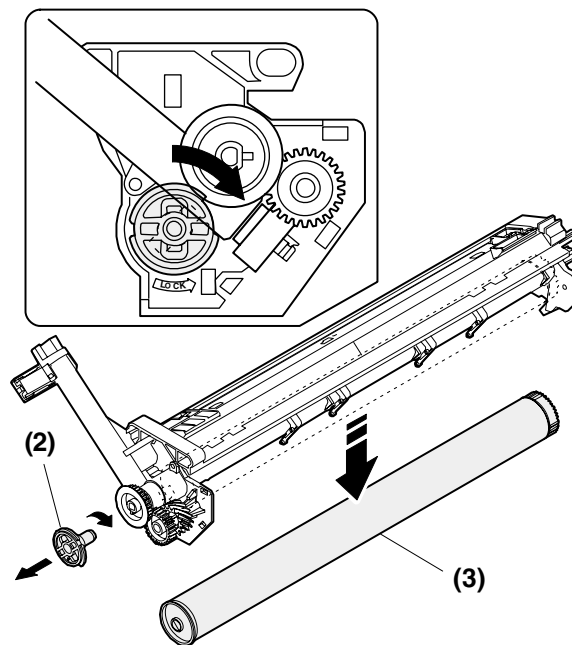


2) Remove the drum cover. (4 Lock Tabs)



3) Remove the drum fixing plate and the photoconductor drum.

(Note) Dispose the drum fixing plate which was removed.

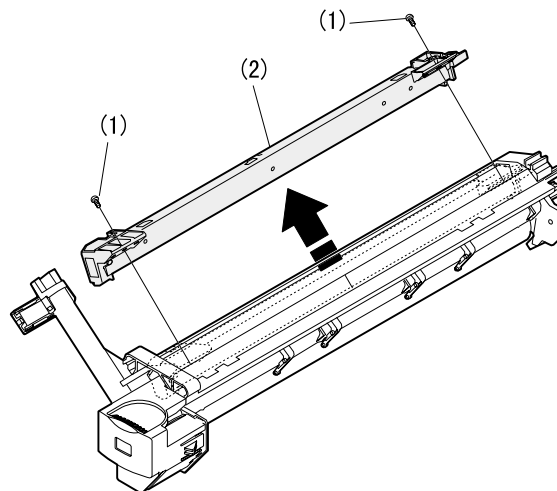


4) Check the cleaning blade and the red felt for no damage.

- If there is any damage, execute all procedures from item 5) and later.
- If there is no damage, execute the procedure of item 12).

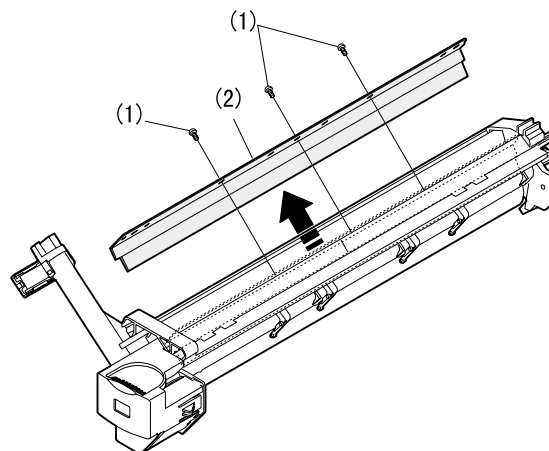
5) Remove the main charger.

(Cleaning the screen grid and the sawteeth.)

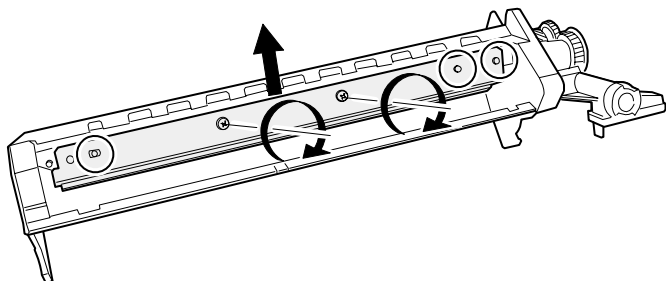


6) Remove the cleaning blade.

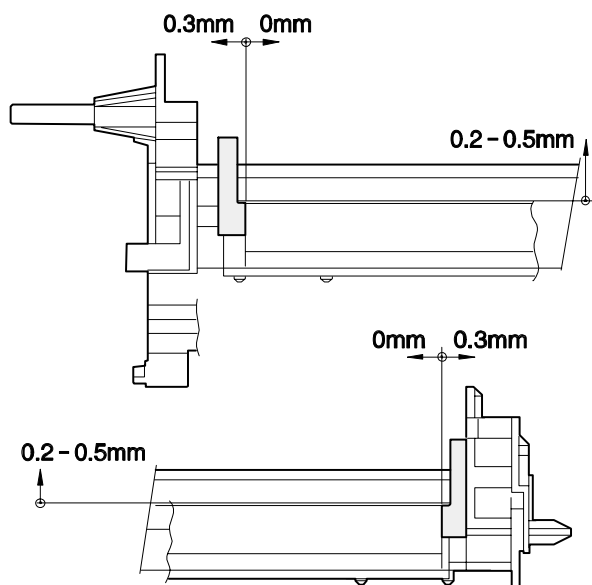
Note: Dispose the cleaning blade which was removed.



- 7) Clean the cleaning section and the waste toner pipe to remove waste toner completely with a vacuum cleaner.
- 8) Remove the felt and duplex tape completely.
Note: Be careful not to scratch or bend the sub blade.
- 9) Attach the cleaning blade.
Securely insert the plate section of the cleaning blade into the dove and fix it with a screw.
Do not touch the cleaning blade rubber with your hand.
When attaching the cleaning blade, press the cleaning blade in the arrow direction and attach.



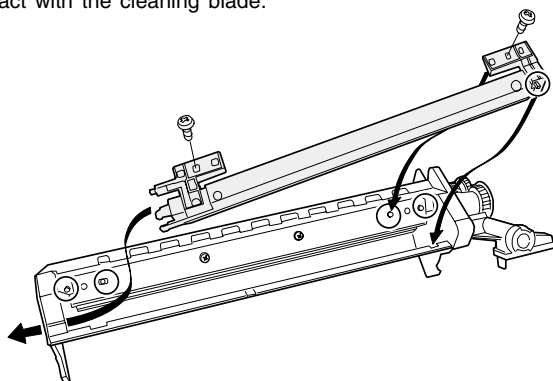
- 10) Attach the felt.



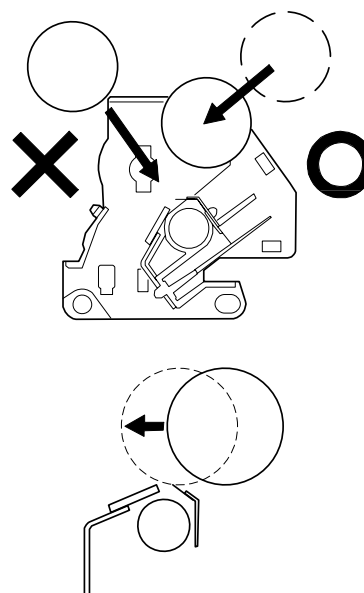
Attach the mocket with slightly pressing section A of the cleaning blade.
Do not touch the tip of the cleaning blade.
Do not put the mocket under the cleaning blade.
Do not put the mocket on the sub blade.
Do not press the sub blade with the mocket.

- 11) Attach the main charger.

Securely set the MC holder on the projection of the process frame.
Securely insert two projections of the MC holder into the groove in the process frame.
When attaching the MC holder ass'y, be careful not to make contact with the cleaning blade.



- 12) Attach the drum fixing plate and the photoconductor drum.
Apply grease to the inside of the photoconductor drum. (Dia. 2)



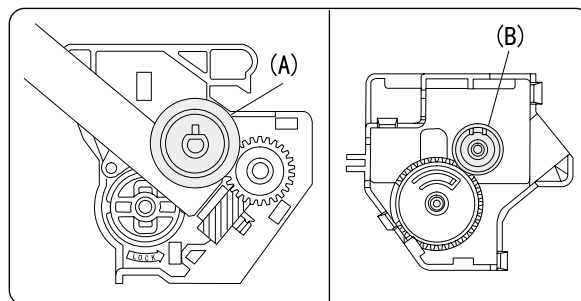
Attach the drum from (b). (Prevention against the sub blade edge breakage)

Attach the drum so that its position with the sub blade is as shown.

- 13) Attach the detection gear.

Note:

- The detection gear is not installed to the drum cartridge packed with the main body. Add a new one.



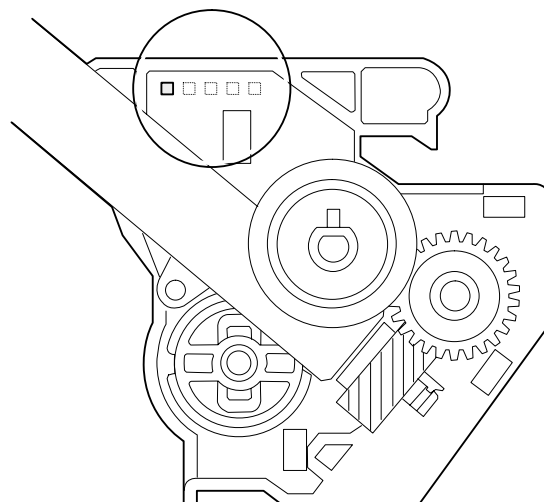
- 14) Attach the drum cover.

Note: After attaching the drum cover, do not make a copy.

When attaching the drum cover, engage the detection gear 20T rib with the 30T gear rib, and attach the drum cover to the process frame.

- 15) Mark the number of times of recycling on the side of the cover with white paint.

Max. times of recycling: 5 times



Note: Another method of cleaning the drum counter is available with SIM 24-07.

[4] SIMULATIONS

The following items are added in this model. (Not provided in the AL series.)

1. List of simulations

Main code		Sub code	Contents
5	Lamp ON check	01 02 03	Operation panel display check (Maintenance lamp added) Fusing lamp ON + cooling fan high speed/low speed Copy lamp ON
20	Maintenance counter clear	01	
21	Counter setup (In maintenance)	01	Maintenance cycle setup
22	Counter display	01 02 05 12 14 21	Maintenance counter Maintenance preset value Total counter Drum counter P-ROM version display Scanner counter

2. Contents of simulations

Main code	Sub code	Contents	Details of operation																				
20	01	Maintenance counter clear	When the PRINT switch is pressed, the maintenance count value is cleared and the value (000000) is displayed.																				
21	01	Maintenance cycle setup	The code of the currently set maintenance cycle value is displayed (initial display), and the set data is stored.																				
			<table><tr><th colspan="2">Key operation/Display</th></tr><tr><th>Code</th><th>Setup</th></tr><tr><td>0</td><td>3,000 pages</td></tr><tr><td>1</td><td>6,000 pages</td></tr><tr><td>2</td><td>9,000 pages</td></tr><tr><td>3</td><td>13,000 pages</td></tr><tr><td>4</td><td>18,000 pages</td></tr><tr><td>5</td><td>Free (999,999 pages) * Default</td></tr></table>	Key operation/Display		Code	Setup	0	3,000 pages	1	6,000 pages	2	9,000 pages	3	13,000 pages	4	18,000 pages	5	Free (999,999 pages) * Default				
			Key operation/Display																				
			Code	Setup																			
			0	3,000 pages																			
			1	6,000 pages																			
			2	9,000 pages																			
			3	13,000 pages																			
4	18,000 pages																						
5	Free (999,999 pages) * Default																						
22	01	Maintenance counter display	The display method is similar to the total counter display.																				
	02	Maintenance reset value display	The quantity corresponding to the code set with 21-01 is displayed. The display method is similar to the total counter display.																				
	05	Total counter display	The total counter value is displayed in 3 digits x 2 times repeatedly.																				
			<table><tr><th colspan="5">Display</th></tr><tr><td colspan="5">(example: 12345)</td></tr><tr><td colspan="5">012 → Blank → 345 → Blank → 012</td></tr><tr><td>0.7s</td><td>0.3s</td><td>0.7s</td><td>1.0s</td><td>0.7s</td></tr></table>	Display					(example: 12345)					012 → Blank → 345 → Blank → 012					0.7s	0.3s	0.7s	1.0s	0.7s
Display																							
(example: 12345)																							
012 → Blank → 345 → Blank → 012																							
0.7s	0.3s	0.7s	1.0s	0.7s																			
	12	Drum counter display	The display method is similar to the total counter display.																				
	14	P-ROM version display	The P-ROM version is displayed in 3 digits on the value display section. (In the AR model, the 100% zoom lamp is displayed.)																				
	21	Scanner counter display	The display method is similar to the total counter display.																				

SHARP**PARTS GUIDE**

CODE:00ZAR150E/P2E

DIGITAL COPIER**AR-120E
MODEL AR-150E****CONTENTS**

- | | |
|--|--|
| 1 Exteriors | 17 Single manual paper feeding unit
(except Pakistan,Philippines,L2,L4) |
| 3 Operation panel | 18 Multi manual paper feeding unit |
| 4 Side door unit | 19 Socket holder unit |
| 5 Optical frame 1 | 20 TC case unit |
| 6 Optical frame 2 | 21 250 sheets tray |
| 9 Delivery paper guide unit | 22 Harness |
| 10 Middle frame | 23 Packing material & accessories |
| 11 Base plate unit 1 | 24 MCU PWB |
| 12 Base plate unit 2 | 25 Operation PWB |
| 13 Fusing unit | 30 DC power supply PWB |
| 14 Drive unit | 31 DV cartridge unit |
| 15 Single manual paper feeding cover unit
(except Pakistan,Philippines) | ■ Index |
| 16 Multi manual paper feeding cover unit | |

The AR-120E/AR-150E Parts Guide describes only the parts changed from AL-1000/AL-1200 Parts Guide. For then common parts, please refer to the AL-1000/AL-1200 Parts Guide.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

DEFINITION

The definition of each Rank is as follows and also noted in the list

A : Parts necessary to be stocked as High usage parts.

B : Parts necessary to be stocked as Standard usage parts.

C : Low usage parts.

D : Parts necessary for refurbish.

E : Unit parts recommended to be stocked for efficient after sales service.

Please note that the lead time for the said parts may be longer than normal parts.

S : Consumable parts.

Please note that the following parts used in Copier under the same description are classified into A or B Rank depending upon the place used.

Example: Gear made of Metal, Sprocket, Bearing, Belt made of Rubber, Spring clutch mechanism.

A Rank : The parts which may be with the revolution or loading.

B Rank : Parts similar to A Rank parts, but are not included in Rank A.

Because parts marked with "⚠" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

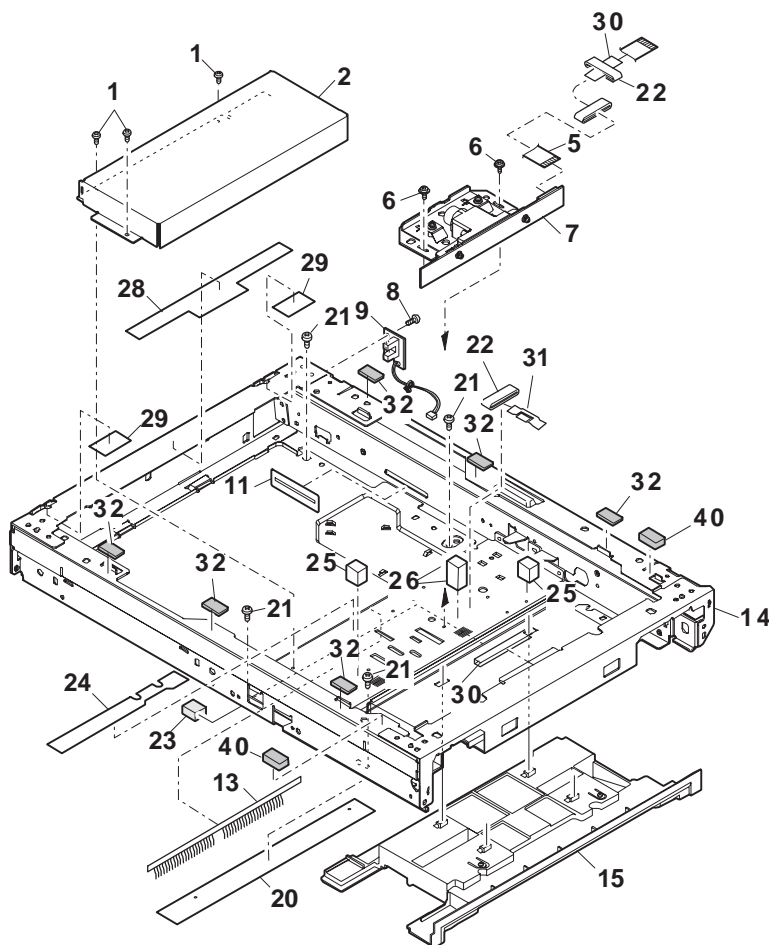
○ Other than this Parts Guide, please refer to documents Service Manual (including Circuit Diagram) of this model.

○ Please use the 13 digit code described in the right hand corner of front cover of the document, when you place an order.

○ For U.S. only-Use order codes provided in advertising literature. Do not order from parts department.

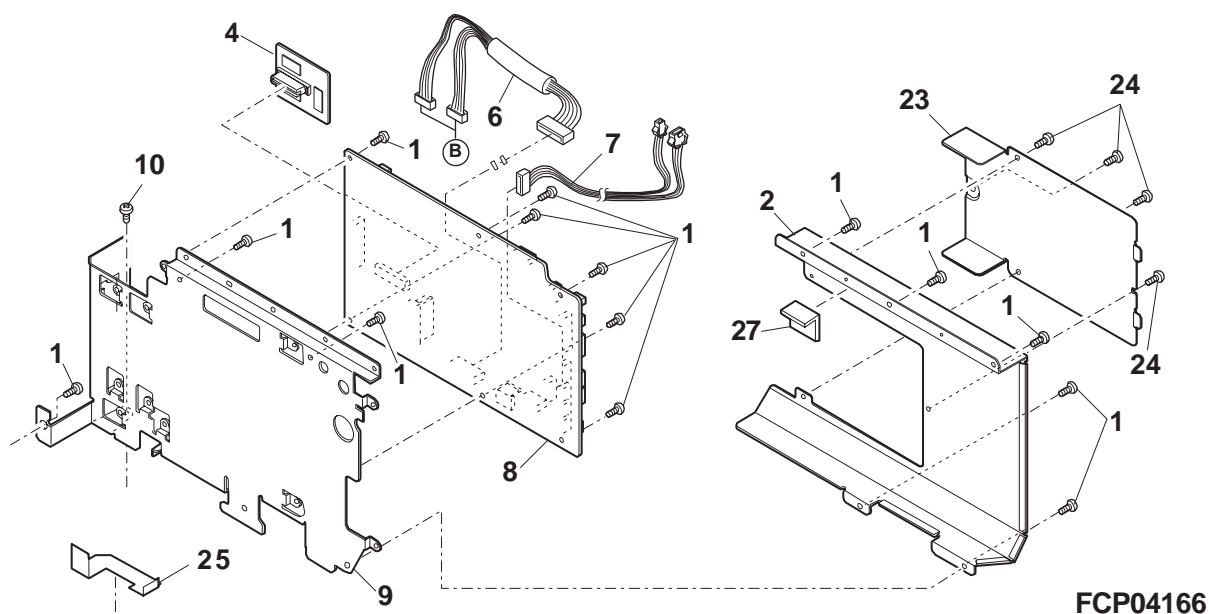
* These parts are supplied by SMF.

6 Optical frame 2

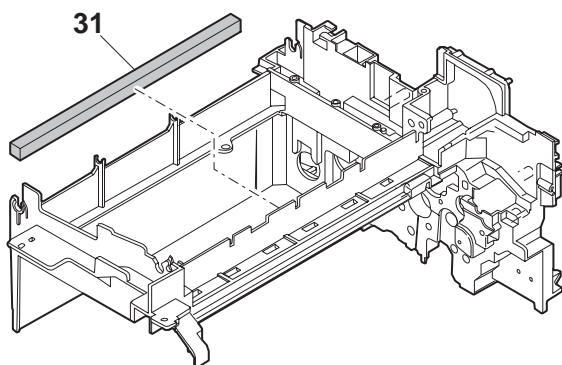


FCP04165

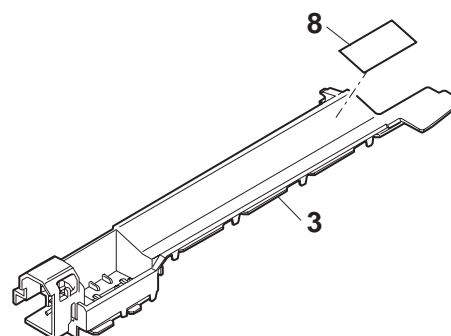
12 Base plate unit 2



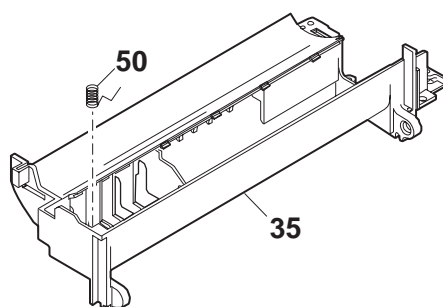
10 Middle frame



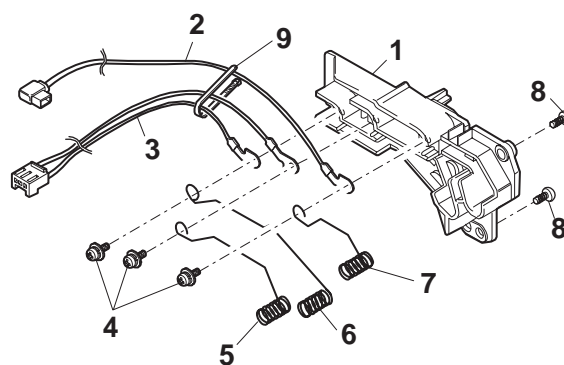
16 Multi manual paper feeding cover unit



18 Multi manual paper feeding unit



19 Socket holder unit



FCP04167

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
11	T L A B H 0 1 6 7 Q S Z Z	AF		C	Operation instruction label (Except Russia, LAG2, LAG4, Pakistan, Philippines)
	T L A B H 0 2 1 4 Q S Z Z	AG	N	C	Operation instruction label (Russian)
20	T L A B Z 0 0 5 8 Q S Z Z	AD		C	Class 1 label (Except Brazil, LAG2)

3 Operation panel

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	P F i L Z 0 0 0 7 Q S 1 3	AS		B	Filter (Inch series)(LAG4, LAG2, L2, L4)
	P F i L Z 0 0 0 7 Q S 1 2	AS	N	B	Filter (Inch series)(Pakistan, Philippines)
	P F i L Z 0 0 0 7 Q S Z 8	AS	N	B	Filter (AB series)
5	C B T N - 0 0 0 4 Q S 0 4	AG		C	Operation key R
6	J B T N - 0 0 0 8 Q S Z 1	AG		C	Operation key L
10	C P N L C 0 0 0 2 Q S 4 8	AV	N	D	Operation panel (AR-150E)
	C P N L C 0 0 0 2 Q S 4 9	AV	N	D	Operation panel (AR-120E)

4 Side door unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
6	M S P R D 0 0 7 6 Q S Z 1	AD		C	Earth spring
9	L F R M - 0 0 0 3 Q S Z 1	AP		C	Side door inner frame
15	N S F T Z 0 0 0 6 Q S Z 1	AG		C	PS shaft
18	C H L D Z 0 0 1 0 Q S 5 2	AU		E	Transcription holder unit

5 Optical frame 1

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	C R E F L 0 0 0 3 Q S 3 2	BQ		E	Copy lamp unit

6 Optical frame 2

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
22	R C Ö R F 0 0 0 2 Q S Z Z	AE		C	Ferrite core
23	P G S K - 1 0 0 4 D C Z Z	AF		C	Gasket
24	P S H E Z 0 0 7 4 Q S Z Z	AE		C	Optical protection sheet
25	P G S K - 0 0 0 1 Q S Z Z	AG		C	Gasket (Except Saudi Arabia, Brazil, LAG2)
26	P G S K - 0 0 0 6 Q S Z Z	AE		C	Gasket (Except Saudi Arabia, Brazil, LAG2)
28	P S H E Z 0 0 8 1 Q S Z 1	AD		C	Cabinet hook seat A
29	P S H E Z 0 0 8 2 Q S Z Z	AB		C	Cabinet hook seat B
30	P S H E Z 0 0 7 2 Q S Z Z	AE		C	Core holding mylar
31	P S H E Z 0 1 4 1 Q S Z Z	AC		C	Core holding mylar
32	P G U M S 0 0 0 4 Q S Z Z	AA		C	Table glass cushion

9 Delivery paper guide unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	N R Ö L P 0 0 0 8 Q S Z Z	AD		C	Delivery roller upper (Inch series)
	N R Ö L P 0 0 4 6 Q S Z Z	AC		C	Delivery roller upper (AB series)

10 Middle frame

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
7	NCPL-0006QSZZ	AC		C	Hopper cupling
12	NFANP0001QSZ1	AX		B	Fan
21	LFRM-0035QSZZ	AZ	N	C	Middle frame
26	LPI NS0009QSZZ	AD		C	DV guide pin (Indonesia,Thailand,LAG3,Singapore,Malaysia,Hong Kong,Brazil,Philippines)
	LPI NS0008QSZZ	AD		C	DV guide pin (Other countries)
31	PMLT-0026QSZZ	AC		C	Cushion

11 Base plate unit 1

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
16	MSPRC0161QSZZ	AF	N	C	Clutch spring
29	PSHEZ2026FCZ1	AB		C	Sheet M1 (Pakistan,LAG2.L2,L4)
30	LHL DZ0017QSZZ	AD		C	Pressure plate holder (Pakistan,LAG2.L2,L4)
31	MSPRC0047QSZZ	AA		C	Pressure plate spring (Pakistan,LAG2.L2,L4)
32	PCÖVP0013QSZZ	AD		C	Multi cover (Pakistan,LAG2.L2,L4)
33	MSPRC0037QSZZ	AB		C	Transport lower roller spring (Pakistan,LAG2.L2,L4)
36	PSHEZ2174FCZZ	AB		C	Paper feeding sheet (Pakistan,LAG2.L2,L4)

12 Base plate unit 2

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
4	CPWBF0013QS52	BL		E	GDI memory PWB 6MB (AR-150E)
6	DHAI-0039QSZZ	BD		C	Center frame harness (100V series)
	DHAI-0064QSZZ	AV		C	Center frame harness (200V series)
	CPWBX0062TS5F	AC	N	E	MCU PWB (AR-150E L2,L4)
8	CPWBX0062QS5C	AC	N	E	MCU PWB (AR-120E)
	CPWBX0062QS5D	AC	N	E	MCU PWB (AR-150E)
9	LPLTM0017QSZ3	AQ		C	PWB holder
13	CPWBF0017QS32	BU		E	DC power supply PWB (120V/127V)(SaudiArabia,Brazil,LAG2)
	CPWBF0017QS37	BU		E	DC power supply PWB (200V series)(Other countries)
25	PSHEZ0195QSZZ	AD		C	Sheet (200V series)
27	PMLT-0028QSZZ	AC		C	Core fixing cushion

13 Fusing unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
16	DHAI-0030QSZ1	AN		C	HL harness 2 (100V series)
	DHAI-0058QSZ1	AL		C	HL harness 2 (200V series)
32	TCAUH0992FCZ1	AF		C	High temperature caution label
33	PSHEZ0045QSZ1	AC		C	PG earth sheet

14 Drive unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
20	CPLTM0042QS02	AY		C	Main drive plate
22	RPLU-0016QSZZ	AN		B	PS solenoid (L2,L4)
	RPLU-0001QSZZ	AN		B	PS solenoid (Other countries)
26	PTME-0003QSZ1	AD		B	Roller pawl

15 Single manual paper feeding cover unit(except Pakistan,Philippines)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	PCÖVP0012QSZ1	AK		C	Single upper cover
6	MSPRP0110QSZ1	AD		C	Door switch spring

16 Multi manual paper feeding cover unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	P C O V P 0 0 2 3 Q S Z 1	AK		C	Multi upper cover
6	M S P R P 0 1 1 0 Q S Z 1	AD		C	Door switch spring
8	P S H E Z 0 0 7 5 Q S Z Z	AC		C	MB upper guide sheet

17 Single manual paper feeding unit(except Pakistan,Philippines,L2,L4)

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	L B N D J 0 0 1 3 F C Z 1	AA		C	Wire band
5	C P L T M 0 0 2 3 Q S 0 2	AF		C	PF plate 1
14	M S P R C 0 0 3 9 Q S Z 1	AC		C	Earth spring
16	M S P R C 0 0 3 8 Q S Z 1	AC		C	Actuator spring
33	M S P R C 0 1 0 9 Q S Z Z	AC		C	Earth spring

18 Multi manual paper feeding unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
25	C P L T M 0 0 2 3 Q S 0 3	AG		C	Paper feed plate 1
50	M S P R C 0 1 0 9 Q S Z Z	AC		C	Spring

19 Socket holder unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	L H L D Z 0 0 0 9 Q S D Z	AG		C	HV interface holder
9	L B N D J 0 0 1 3 F C Z 1	AA		C	Wire band

20 TC case unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	P S H E P 0 0 1 9 Q S Z 1	AC		C	TC sheet
14	L H L D Z 0 0 1 0 Q S Z 1	AL		C	TC holder
	(Unit)				
901	C H L D Z 0 0 1 0 Q S 5 2	AU		E	Transcription holder unit

21 250 sheets tray

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
	(Unit)				
901	C C A S P 0 0 0 1 Q S 5 3	BD		E	250 Tray unit

22 Harness

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	D H A i - 0 0 6 4 Q S Z 2	AV		C	Center frame harness (200V series)

23 Packing material & accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
3	QACCD7618QCZZ	AQ		B	AC cord (L2,Brazil,LAG2)
	QACCR7621QCZZ	AZ		B	AC cord (LAG4,L4)
	QACCB7521QCZZ	AS		B	AC cord (South Africa)
	QACCV6621QCN1	AU		B	AC cord (Russian,Lebasnon,Iran,Indonesia,Thailand,LAG3,Pakistan)
	QACCJ9610QCZZ	AR		B	AC cord (Philippines)
	QACCF7620QCZZ	AX		B	AC cord (Singapore,Malaysia)
	QACCB7620QCZZ	AY		B	AC cord (Saudi Arabia)
7	QACCB7622QCN1	AZ		B	AC cord (Hong Kong)
	TINSS0381TSZZ	*	N	D	Operation manual (Spanish)
	TINSE0378QSZZ	*	N	D	Operation manual (English)
	TINSZ0379QSZZ	*	N	D	Operation manual (Arabic)
	TINSF0380QSZZ	*	N	D	Operation manual (French)
	TINSE0382QSZZ	*	N	D	Operation manual (Hong Kong)
	TINSR0383QSZZ	*	N	D	Operation manual (Russian)
8	SSAKA2341QSZZ	AA		C	Vinyl bag (230×340mm)(Except AR-150E L2,L4)
10	SPAKC0052TS6C	*	N	D	Packing case (AR-150E L2,L4)
	SPAKC0052QS63	*	N	D	Packing case (AR-150E)
	SPAKC0052QS64	*	N	D	Packing case (AR-120E)
105	TCAUH0007QSZZ	AD		D	Caution label (L4)
106	TLABZ0106QSZZ	AF	N	C	Label (L4)
107	TCAUS0009QSZZ	AF		C	Card (LAG4)
108	QCNW-0122FCZZ	AR		C	Lead wire (127V)(Saudi Arabia)
109	QPLGA0002QCZZ	AN		C	Plug (125V)(Saudi Arabia)
110	QTANP0096FCZZ	AA		C	Terminal (Saudi Arabia)
111	PHOG-1023CCZZ	AB		C	Plug protector (South Africa)
112	QPLGA4171CCZZ	AN		C	Plug (South Africa)(250V)
113	QPLGA0001QCZZ	AN		C	Plug (Brazil)(250V)
114	GCÖVZ0149FCZZ	AU		C	Dust cover (Lebanon,Iran,Saudi Arabia,)

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	VHI341256SJ12	AN		B	IC (N341256SJ-12) [IC104,IC107,IC115,IC116]
2	VHIULN2003AN1	AE		B	IC (ULN2003A) [IC103,IC102]
3	PGSK-0002QSZZ	AD		C	Gasket
4	PSHEZ0110QSZZ	AB		C	MCU insulator
5	QCNCM0923FC18	AF		C	Connector (B18B-PHDSS-B) [CN119]
6	QCNCM0923FC24	AF		C	Connector (B24B-PHDSS-B) [CN101]
7	QCNCM1005MCZZ	AB		C	Connector (B2P-VH) [CN105]
8	QCNCM1069AC0D	AC		C	Connector (B4P-VH) [CN103]
9	QCNCM1119LC0E	AC		C	Connector (B5B-PH-K-M) [CN109]
10	QCNCM2401SC0C	AB		C	Connector (B3B-PH-K-R) [CN111]
11	QCNCM2401SC0D	AC		C	Connector (B4B-PH-K-R) [CN112]
12	QCNCM2401SC0E	AC		C	Connector (B5B-PH-K-R) [CN110]
13	QCNCM2401SC0F	AB		C	Connector (B6B-PH-K-R) [CN117]
14	QCNCM7014SC0C	AA		C	Connector (B3B-PH-K-S) [CN104,CN118,CN125]
15	QCNCM7014SC0D	AB		C	Connector (B4B-PH-K-S) [CN107]
16	QCNCM7014SC0E	AB		C	Connector (B5B-PH-K-S) [CN120]
17	QCNCM0340QCZZ	AC		C	Connector (B3B-PH-K-K) [CN102]
18	QCNCW0012QSZZ	AH		C	Connector (52340-0401(40pin)) [CN108]
19	QCNCW0015QSZZ	AE		C	Connector (52147-0510(5pin)) [CN122]
20	QCNCW0024QSZZ	AF		C	Connector (FF4-32-S15D5) [CN124]
21	QCNCW1124LC0D	AB		C	Connector (04FE-BT-VK-N) [CN121]
22	QCNCW1124LC0H	AC		C	Connector (08FE-BT-VK-N) [CN113]
23	QCNCW1124LC1H	AD		C	Connector (18FE-BT-VK-N) [CN116]
24	QCNCW1124LC2F	AD		C	Connector (26FE-BT-VK-N) [CN114]
25	QSOCZ0002GCZZ	AD		C	IC socket (40pin) [(IC105)]
26	QSOCZ6408ACZZ	AB		C	8P DIP socket (8pin) [(IC112)]
27	RCILZ0003QSZZ	AC		C	Coil (HF50ACC201209) [L104,L105,L106,L110,L111,L112]
28	RCILZ0004QSZZ	AE		C	Coil (NFM839R02C470R101) [NF102,NF101]
29	RCILZ1032CCZZ	AD		C	Coil (SBO-02SAN) [L101,L102,L103,L107,L108,L109]
30	RCRSZ0001QSZZ	AG		B	Crystal (AT-51(19.6608MHz)) [X101]
31	RCRSZ0002QSZZ	AP		B	Crystal (1329(15.4265MHz)) [X102]
32	RCRSZ0003QSZZ	AP		B	Crystal (1330(22.0000MHz)) [X103]
33	RH-DZ0016FCZZ	AB		B	Diode (MA700) [D108]
34	RMPTW4100QCJJ	AA		B	Block resistor (10KΩ×4) [BR130,BR134,BR136,BR139,BR156, BR157,BR171,BR173]
35	RMPTW4102QCJJ	AB		B	Block resistor (1.0KΩ×4) [BR119,BR120]
36	RMPTW4203QCJJ	AA		B	Block resistor (20KΩ×4 1/32W ±5%) [BR101,BR102,BR103,BR104,BR105,BR106,BR107,BR108,BR109,BR110]
37	RMPTW4203QCJJ	AA		B	Block resistor (20KΩ×4 1/32W ±5%) [BR111,BR112,BR113,BR114,BR115,BR116,BR117,BR118,BR121,BR122]
38	RMPTW4203QCJJ	AA		B	Block resistor (20KΩ×4 1/32W ±5%) [BR127,BR128,BR129,BR137,BR141,BR142,BR143,BR144,BR145,BR146]
39	RMPTW4203QCJJ	AA		B	Block resistor (20KΩ×4 1/32W ±5%) [BR147,BR148,BR149,BR150,BR151]
40	RMPTW4203QCJJ	AA		B	Block resistor (20KΩ×4 1/32W ±5%) [BR161,BR164,BR165,BR166,BR167,BR168]
41	RMPTW4300QCJJ	AA		B	Block resistor (30KΩ×4 1/32W ±5%) [BR172,BR170]

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
42	RMPTW4470QCJJ	AB		B	Block resistor (47Ω×4 1/32W ±5%) [BR123, BR124, BR125, BR126, BR131, BR132, BR133, BR135, BR138, BR140]
43	RMPTW4470QCJJ	AB		B	Block resistor (47Ω×4 1/32W ±5%) [BR152, BR153, BR154, BR155, BR158, BR159, BR160, BR162, BR163]
44	TLABZ3405FCZZ	AB		D	Version label
46	VCCCCY1HH101J	AA		C	Capacitor (100pF/50V) [C296, C297, C298, C299, C300, C304, C306, C307, C312, C319]
47	VCCCCY1HH101J	AA		C	Capacitor (100pF/50V) [C320, C321, C324, C333, C334, C335, C336, C337, C338, C344]
48	VCCCCY1HH101J	AA		C	Capacitor (100pF/50V) [C345, C346, C348, C355, C356, C361, C362, C365, C366, C371]
49	VCCCCY1HH120J	AA		C	Capacitor (12pF/50V) [C378, C358]
50	VCCCCY1HH180J	AA		C	Capacitor (18pF/50V) [C213, C351, C352, C390, C391, C393, C394, C396, C404, C447, C448, C449, C450]
51	VCCCCY1HH330J	AA		C	Capacitor (33pF/50V) [C305, C314, C317, C374, C414, C415, C416, C417, C424, C425, C426, C427]
52	VCCCCY1HH470J	AA		C	Capacitor (47pF/50V) [C209, C210, C211, C212, C214, C231, C232, C233, C234, C235]
53	VCCCCY1HH470J	AA		C	Capacitor (47pF/50V) [C236, C237, C238, C240, C241, C242, C243, C247, C248, C249]
54	VCCCCY1HH470J	AA		C	Capacitor (47pF/50V) [C250, C251, C252, C253, C254, C260, C268, C269, C270, C271]
55	VCCCCY1HH470J	AA		C	Capacitor (47pF/50V) [C272, C273, C285, C286, C287, C308, C316, C332, C342, C343]
56	VCCCCY1HH470J	AA		C	Capacitor (47pF/50V) [C360, C370, C429]
57	VCEAGA1CW106M	AA		C	Capacitor (10μF/16V) [C106, C109, C110, C113]
58	VCEAGA1CW107M	AC		C	Capacitor (100μF/16V) [C102]
59	VCEAGA1CW226M	AB		C	Capacitor (22μF/16V) [C101, C108]
60	VCEAGA1CW476M	AB		C	Capacitor (47μF/16V) [C116]
61	VCEAGA1EW106M	AA		C	Capacitor (10μF/25V) [C114, C115]
62	VCEAGA1EW476M	AA		C	Capacitor (47μF/25V) [C112]
63	VCEAGA1HW474M	AB		C	Capacitor (0.47μF/50V) [C104]
64	VCEAGA1VW106M	AA		C	Capacitor (10μF/35V) [C105]
65	VCEAGA1VW226M	AC		C	Capacitor (22μF/35V) [C103]
66	VCEAGA1VW476M	AB		C	Capacitor (47μF/35V) [C111]
67	VCKYCY1CF104Z	AA		C	Capacitor (0.1μF/16V) [C201, C206, C207, C208, C216, C245, C257, C258, C259, C274]
68	VCKYCY1CF104Z	AA		C	Capacitor (0.1μF/16V) [C295, C309, C310, C313, C315, C318, C322, C323, C325, C326]
69	VCKYCY1CF104Z	AA		C	Capacitor (0.1μF/16V) [C327, C328, C329, C330, C340, C341, C347, C353, C354, C357]
70	VCKYCY1CF104Z	AA		C	Capacitor (0.1μF/16V) [C359, C363, C375, C381, C385, C389, C392, C397, C408, C409]
71	VCKYCY1CF104Z	AA		C	Capacitor (0.1μF/16V) [C410, C413, C420, C421, C422, C423, C428, C432, C433]
72	VCKYCY1EB223K	AA		C	Capacitor (22000pF/25V) [C219, C246, C264, C265, C303, C376, C380, C382, C386, C412]
73	VCKYCY1HB102K	AA		C	Capacitor (1000pF/50V) [C217, C261, C262, C263, C277, C278, C288, C290, C291, C301]
74	VCKYCY1HB102K	AA		C	Capacitor (1000pF/50V) [C311, C331, C339, C349, C350, C364, C367, C368, C369, C377]
75	VCKYCY1HB102K	AA		C	Capacitor (1000pF/50V) [C379, C384, C387, C395, C405, C406, C407, C418, C419]
76	VCKYCY1HB102K	AA		C	Capacitor (1000pF/50V) [C430, C431, C435]
77	VCKYCY1HB222K	AA		C	Capacitor (2200pF/50V) [C205, C400, C401, C411]
78	VCKYCY1HB471K	AB		C	Capacitor (470pF/50V) [C372, C373]
79	VCKYTW1HB104K	AC		C	Capacitor (0.1μF/50V) [C215]
80	VCQYNA1HM104K	AB		C	Capacitor (0.1μF/50V) [C107]
81	VHD1N4005E/-1	AB		B	Diode (1N4005) [D102]
82	VHDDA204K/-1	AC		B	Diode (DA204K) [D201, D203, D205, D206, D207]
83	VHDDAN202U/-1	AB		B	Diode (DAN202U) [D113, D114, D115, D117, D118, D121, D122, D126]
84	VHDDAP202U/-1	AB		B	Diode (DAP202U) [D110, D111, D112, D116, D119, D120, D124]
85	VHDDSS133/-1	AA		B	Diode (1SS133) [D101, D103, D104, D105, D106, D107, D109, D125, D130]
86	VHi74VHC08/-1	AE		B	IC (74VHC08) [IC204]
87	VHiH8S/2350FP	AY		B	CPU (H8S/2350) [IC108]
88	VHiHG73C025FD	BE		B	IC (HG73C039FD) [IC110]
89	VHiLM358PS/-S	AC		B	IC (LM358) [IC209]
90	VHiM24C02WBN6	AG		B	IC (M24C02-WBN6) [IC112]
91	VHiM51953BL-1	AF		B	IC (M51953) [IC106]
92	VHiM66236FP-1	AT		B	IC (M66236FP) [IC208]
93	VHi27C02015QS	AZ	N	B	2M EPROM (AR-150EAE/AR-150EBE) [IC105]
	VHi27C02025QS	AZ	N	B	2M EPROM (L2,L4) [IC105]
	VHi27C01014QS	AX	N	B	2M EPROM (AR-120EAE/AR-120EBE) [IC105]
94	VHiNJM2903M/-	AD		B	IC (NJM2903M) [IC201]
95	VHiNJM3414M-1	AF		B	IC (NJM3414AM) [IC210]
96	VHiSLA7027MU/-	AQ		B	IC (SLA7027MU) [IC113]
97	VHiSN74LS07NS	AF		B	IC (74LS07) [IC207, IC205]
98	VHiTA7291S/-1	AF		B	IC (TA7291S) [IC101]
99	VHiTC74HC14FN	AH		B	IC (74HC14) [IC211]
100	VHiTC74HC151F	AG		B	IC (74HC151) [IC203, IC206]
101	VHiTD62503F/-	AG		B	IC (TD62503) [IC109]
102	VHViCPN38/-1	AF		B	IC protector (ICP-N38) [CP102]
103	VRS-CY1JD000J	AA		C	Resistor (1/16W 0Ω ±5%) [R247, R272, J203]
104	VRS-CY1JD100J	AA		C	Resistor (1/16W 10Ω ±5%) [R246, R248, R253, R257, R294, R301]
105	VRS-CY1JD101J	AA		C	Resistor (1/16W 100Ω ±5%) [R273, R304, R319]
106	VRS-CY1JD102F	AA		C	Resistor (1/16W 1KΩ ±1%) [R214]
107	VRS-CY1JD102J	AA		C	Resistor (1/16W 1.0KΩ ±5%) [R206, R228, R229, R231, R239, R251, R252, R261, R277, R284]
108	VRS-CY1JD102J	AA		C	Resistor (1/16W 1.0KΩ ±5%) [R295, R303, R331, R333, R339, R340]
109	VRS-CY1JD103F	AB		C	Resistor (1/16W 10KΩ ±1%) [R215, R223, R328, R329]
110	VRS-CY1JD103J	AA		C	Resistor (1/16W 10KΩ ±5%) [R207, R226, R234, R240, R244, R258, R262, R264]
111	VRS-CY1JD103J	AA		C	Resistor (1/16W 10KΩ ±5%) [R265, R276, R282, R283, R310, R311]
112	VRS-CY1JD105F	AA		C	Resistor (1/16W 1.0MΩ ±1%) [R218]
113	VRS-CY1JD122J	AA		C	Resistor (1/16W 1.2KΩ ±5%) [R220]
114	VRS-CY1JD152J	AA		C	Resistor (1/16W 1.5KΩ ±5%) [R287, R288, R291]
115	VRS-CY1JD202J	AA		C	Resistor (1/16W 2.0KΩ ±5%) [R297]

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NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
116	VRS-CY1JD203J	AA		C	Resistor (1/16W 20KΩ ±5%) [R225,R227,R230,R241,R242, R243,R245,R250,R254,R256]
117	VRS-CY1JD203J	AA		C	Resistor (1/16W 20KΩ ±5%) [R269,R274,R275,R281,R293, R300,R341,R342]
118	VRS-CY1JD205J	AA		C	Resistor (1/16W 2.0MΩ ±5%) [R322,R325]
119	VRS-CY1JD242J	AA		C	Resistor (1/16W 2.4KΩ ±5%) [R320,R321]
120	VRS-CY1JD301J	AA		C	Resistor (1/16W 300Ω ±5%) [R312,R298]
121	VRS-CY1JD331J	AA		C	Resistor (1/16W 330Ω ±5%) [R280]
122	VRS-CY1JD332J	AA		C	Resistor (1/16W 3.3KΩ ±5%) [R255]
123	VRS-CY1JD333J	AA		C	Resistor (1/16W 33KΩ ±5%) [R213]
124	VRS-CY1JD470J	AA		C	Resistor (1/16W 47Ω ±5%) [R235,R260,R263,R266,R267, R268,R270,R271]
125	VRS-CY1JD470J	AA		C	Resistor (1/16W 47Ω ±5%) [R292,R305,R313,R317]
126	VRS-CY1JD472J	AA		C	Resistor (1/16W 4.7KΩ ±5%) [R209,R216,R296]
127	VRS-CY1JD473J	AA		C	Resistor (1/16W 47KΩ ±5%) [R204,R205,R208,R210,R307,R308]
128	VRS-CY1JD512J	AA		C	Resistor (1/16W 5.1KΩ ±5%) [R332]
129	VRS-CY1JD621F	AA		C	Resistor (1/16W 620Ω ±1%) [R221]
130	VRS-CY1JD621J	AA		C	Resistor (1/16W 620Ω ±5%) [R299]
131	VRS-CY1JD680J	AA		C	Resistor (1/16W 68Ω ±5%) [R259]
132	VRS-CY1JD751J	AA		C	Resistor (1/16W 75Ω ±5%) [R309]
133	VRS-CY1JD752J	AA		C	Resistor (1/16W 7.5KΩ ±5%) [R217,R236,R302]
134	VRS-CY1JD912J	AA		C	Resistor (1/16W 9.1KΩ ±5%) [R334]
135	VRS-HT3DA102J	AA		C	Resistor (2W 1.0KΩ ±5%) [R101]
136	VRS-HT3DA1R0J	AB		C	Resistor (2W 1.0Ω ±5%) [R104,R105]
137	VRS-HT3DAR22J	AA		C	Resistor (2W 0.22Ω ±5%) [R102]
138	VRS-TP2BD121J	AA		C	Resistor (1/8W 120Ω ±5%) [R249]
139	VRS-TP2BD151J	AA		C	Resistor (1/8W 150Ω ±5%) [R219,R224,R318,R338]
140	VRS-TP2BD221J	AB		C	Resistor (1/8W 220Ω ±5%) [R222]
141	VRS-TP2BD241J	AA		C	Resistor (1/8W 240Ω ±5%) [R202,R203]
142	VRS-TP2BD432J	AA		C	Resistor (1/8W 4.3KΩ ±5%) [R212]
143	VRS-TP2BD472J	AA		C	Resistor (1/8W 4.7KΩ ±5%) [R211,R201]
144	VS2SA1036KQRC	AB		B	Transistor (2SA1036K) [Q201,Q203]
145	VSDTA143XK/-1	AB		B	Transistor (DTA143XKA) [Q204]
146	VSDTC114EKA-1	AC		B	Transistor (DTC114EKA) [Q202]
	(Unit)				
901	CPWBX0062TS5F	CA	N	E	MCU PWB (AR-150E L2,L4)
	CPWBX0062QS5D	CA	N	E	MCU PWB (AR-150E)
	CPWBX0062QS5C	CA	N	E	MCU PWB (AR-120E)

25 Operation PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
4	QSW-P0005QSZZ	AC		B	Tact switch (B3F-6102)(LAG4,L2,L4) [CLK,PSW,1UPK,10UPK,ZUPK,ZDWK,MAGK,CRSK,EXUPK,EXDWK,EXMODK]
	QSW-P0005QSZZ	AC		B	Tact switch (B3F-6102)(Other countries) [CLK,PSW,1UPK,10UPK,ZUPK,ZDWK,MAGK,CRSK,EXUPK,EXDWK,EXMODK,BPK]
14	VHP1LHEE-002A	AC		B	LED(Green) (LAG4,L2,L4) [RPL,ONLL,ZPL,1ENR,2ENR,NOR,1RE,2RE,3RE,]
	VHP1LHEE-002A	AC		B	LED(Green) (LAG4,L2,L4) [CS1L,EXD,EXN,EXL,AE,ME,PE,PML]
	VHP1LHEE-002A	AC		B	LED(Green) (Other countries) [RPL,ONLL,ZPL,1ENR,2ENR,NOR,1RE,2RE,3RE,]
	VHP1LHEE-002A	AC		B	LED(Green) (Other countries) [CS1L,EXD,EXN,EXL,AE,ME,PE,PML,BPL]
15	VHP1LHLE-002A	AC		B	LED(Red) [TPL,MPL,DPL,JPL]
	(Unit)				
901	CPWBF0014QS51	BR		E	Operation PWB (LAG4,L2,L4)
	CPWBF0014QS52	BR		E	Operation PWB (Other countries)

30 DC power supply PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
	(Unit)				
901	CPWBF0017QS32	BU		E	DC power supply PWB (120V/127V)(Saudi Arabia,Brazil,LAG2)
	CPWBF0017QS37	BU		E	DC power supply PWB (200V series)(Other countries)

31 DV cartridge unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	CB0X-0007JS54	AX		E	Toner box unit (L2,L4)
	CB0X-0007YS53	BL		E	Toner box unit (Russia,Lebanon,Iran,South Africa,Saudi Arabia,LAG4,Pakistan,LAG2)
	CB0X-0007YS51	BL		E	Toner box unit (Indonesia,Thailand,LAG3,Singapore,Malaysia,Hong kong,Brazil,Philippines)
501	CB0X-0002RS54	BF		E	DV box unit (L2,L4)
	CB0X-0002QS53	BF	N	E	DV box unit (Other countries)

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PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
【C】					
CBOX-0002QS53	31-501	BF	N	E	
CBOX-0002RS54	31-501	BF		E	
CBOX-0007JS54	31- 1	AX		E	
CBOX-0007YS51	31- 1	BL		E	
CBOX-0007YS53	31- 1	BL		E	
CBTN-0004QS04	3- 5	AG		C	
CCASP0001QS53	21-901	BD		E	
CHLDZ0010QS52	4- 18	AU		E	
“	20-901	AU		E	
CPLTM0023QS02	17- 5	AF		C	
CPLTM0023QS03	18- 25	AG		C	
CPLTM0042QS02	14- 20	AY		C	
CPNLC0002QS48	3- 10	AV	N	D	
CPNLC0002QS49	3- 10	AV	N	D	
CPWBF0013QS52	12- 4	BL		E	
CPWBF0014QS51	25-901	BR		E	
CPWBF0014QS52	25-901	BR		E	
CPWBF0017QS32	12- 13	BU		E	
“	30-901	BU		E	
CPWBF0017QS37	12- 13	BU		E	
“	30-901	BU		E	
CPWBX0062QS5C	12- 8	AC	N	E	
“	24-901	CA	N	E	
CPWBX0062QS5D	12- 8	AC	N	E	
“	24-901	CA	N	E	
CPWBX0062TS5F	12- 8	AC	N	E	
“	24-901	CA	N	E	
CREFL0003QS32	5- 3	BQ		E	
【D】					
DHAI-0030QSZ1	13- 16	AN		C	
DHAI-0039QSZZ	12- 6	BD		C	
DHAI-0058QSZ1	13- 16	AL		C	
DHAI-0064QSZ2	12- 6	AV		C	
“	22- 3	AV		C	
【G】					
GCÖVZ0149FCZZ	23-114	AU		C	
【J】					
JBTN-0008QSZ1	3- 6	AG		C	
【L】					
LBNDJ0013FCZ1	17- 3	AA		C	
“	19- 9	AA		C	
LFRM-0003QSZ1	4- 9	AP		C	
LFRM-0035QSZZ	10- 21	AZ	N	C	
LHLDZ0009QSDZ	19- 1	AG		C	
LHLDZ0010QSZ1	20- 14	AL		C	
LHLDZ0017QSZZ	11- 30	AD		C	
LPI NS0008QSZZ	10- 26	AD		C	
LPI NS0009QSZZ	10- 26	AD		C	
LPLTM0017QSZ3	12- 9	AQ		C	
【M】					
MSPRC0037QSZZ	11- 33	AB		C	
MSPRC0038QSZ1	17- 16	AC		C	
MSPRC0039QSZ1	17- 14	AC		C	
MSPRC0047QSZZ	11- 31	AA		C	
MSPRC0109QSZZ	17- 33	AC		C	
“	18- 50	AC		C	
MSPRC0161QSZZ	11- 16	AF	N	C	
MSPRD0076QSZ1	4- 6	AD		C	
MSPRP0110QSZ1	15- 6	AD		C	
“	16- 6	AD		C	
【N】					
NCPL-0006QSZZ	10- 7	AC		C	
NFANP0001QSZ1	10- 12	AX		B	
NRÖLP0008QSZZ	9- 1	AD		C	
NRÖLP0046QSZZ	9- 1	AC		C	
NSFTZ0006QSZ1	4- 15	AG		C	
【P】					
PCÖVP0012QSZ1	15- 3	AK		C	
PCÖVP0013QSZZ	11- 32	AD		C	
PCÖVP0023QSZ1	16- 3	AK		C	
PFI LZ0007QS12	3- 1	AS	N	B	
PFI LZ0007QS13	3- 1	AS		B	
PFI LZ0007QS28	3- 1	AS	N	B	
PGSK-0001QSZZ	6- 25	AG		C	
PGSK-0002QSZZ	24- 3	AD		C	
PGSK-0006QSZZ	6- 26	AE		C	
PGSK-1004DCZZ	6- 23	AF		C	
PGUMS0004QSZZ	6- 32	AA		C	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
PHÖG-1023CCZZ	23-111	AB		C	
PMLT-0026QSZZ	10- 31	AC		C	
PMLT-0028QSZZ	12- 27	AC		C	
PSHEP0019QSZ1	20- 3	AC		C	
PSHEZ0045QSZ1	13- 33	AC		C	
PSHEZ0072QSZZ	6- 30	AE		C	
PSHEZ0074QSZZ	6- 24	AE		C	
PSHEZ0075QSZZ	16- 8	AC		C	
PSHEZ0081QSZ1	6- 28	AD		C	
PSHEZ0082QSZZ	6- 29	AB		C	
PSHEZ0110QSZZ	24- 4	AB		C	
PSHEZ0141QSZZ	6- 31	AC		C	
PSHEZ0195QSZZ	12- 25	AD		C	
PSHEZ2026FCZ1	11- 29	AB		C	
PSHEZ2174FCZZ	11- 36	AB		C	
PTME-0003QSZ1	14- 26	AD		B	
【Q】					
QACCB7521QCZZ	23- 3	AS		B	
QACCB7620QCZZ	23- 3	AY		B	
QACCB7622QCN1	23- 3	AZ		B	
QACCD7618QCZZ	23- 3	AQ		B	
QACCF7620QCZZ	23- 3	AX		B	
QACCJ9610QCZZ	23- 3	AR		B	
QACCR7621QCZZ	23- 3	AZ		B	
QACCV6621QCN1	23- 3	AU		B	
QCNCM0923FC18	24- 5	AF		C	
QCNCM0923FC24	24- 6	AF		C	
QCNCM1005MCZZ	24- 7	AB		C	
QCNCM1069AC0D	24- 8	AC		C	
QCNCM1119LC0E	24- 9	AC		C	
QCNCM2401SC0C	24- 10	AB		C	
QCNCM2401SC0D	24- 11	AC		C	
QCNCM2401SC0E	24- 12	AC		C	
QCNCM2401SC0F	24- 13	AB		C	
QCNCM7014SC0C	24- 14	AA		C	
QCNCM7014SC0D	24- 15	AB		C	
QCNCM7014SC0E	24- 16	AB		C	
QCNCP0340QCZZ	24- 17	AC		C	
QCNCW0012QSZZ	24- 18	AH		C	
QCNCW0015QSZZ	24- 19	AE		C	
QCNCW0024QSZZ	24- 20	AF		C	
QCNCW1124LC0D	24- 21	AB		C	
QCNCW1124LC0H	24- 22	AC		C	
QCNCW1124LC1H	24- 23	AD		C	
QCNCW1124LC2F	24- 24	AD		C	
QCNCW-0122FCZZ	23-108	AR		C	
QPLGA0001QCZZ	23-113	AN		C	
QPLGA0002QCZZ	23-109	AN		C	
QPLGA4171CCZZ	23-112	AN		C	
QSÖCZ0002GCZZ	24- 25	AD		C	
QSÖCZ6408ACZZ	24- 26	AB		C	
QSW-P0005QSZZ	25- 4	AC		B	
QTANP0096FCZZ	23-110	AA		C	
【R】					
RCi LZ0003QSZZ	24- 27	AC		C	
RCi LZ0004QSZZ	24- 28	AE		C	
RCi LZ1032CCZZ	24- 29	AD		C	
RCÖRF0002QSZZ	6- 22	AE		C	
RCRSZ0001QSZZ	24- 30	AG		B	
RCRSZ0002QSZZ	24- 31	AP		B	
RCRSZ0003QSZZ	24- 32	AP		B	
RH-DZ0016FCZZ	24- 33	AB		B	
RMPTW4100QCJJ	24- 34	AA		B	
RMPTW4102QCJJ	24- 35	AB		B	
RMPTW4203QCJJ	24- 36	AA		B	
“	24- 37	AA		B	
“	24- 38	AA		B	
“	24- 39	AA		B	
“	24- 40	AA		B	
RMPTW4300QCJJ	24- 41	AA		B	
RMPTW4470QCJJ	24- 42	AB		B	
“	24- 43	AB		B	
RPLU-0001QSZZ	14- 22	AN		B	
RPLU-0016QSZZ	14- 22	AN		B	
【S】					
SPAKC0052QS63	23- 10	*	N	D	
SPAKC0052QS64	23- 10	*	N	D	
SPAKC0052TS6C	23- 10	*	N	D	
SSAKA2341QSZZ	23- 8	AA		C	
【T】					
TCAUH0007QSZZ	23-105	AD		D	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
TCAUH0992FCZ1	13- 32	AF		C	
TCAUS0009QSZZ	23-107	AF		C	
TiNSE0378QSZZ	23- 7	*	N	D	
TiNSE0382QSZZ	23- 7	*	N	D	
TiNSF0380QSZZ	23- 7	*	N	D	
TiNSR0383QSZZ	23- 7	*	N	D	
TiNSS0381TSZZ	23- 7	*	N	D	
TiNSZ0379QSZZ	23- 7	*	N	D	
TLABH0167QSZZ	1- 11	AF		C	
TLABH0214QSZZ	1- 11	AG	N	C	
TLABZ0058QSZZ	1- 20	AD		C	
TLABZ0106QSZZ	23-106	AF	N	C	
TLABZ3405FCZZ	24- 44	AB		D	
【V】					
VCCCCY1HH101J	24- 46	AA		C	
“	24- 47	AA		C	
“	24- 48	AA		C	
VCCCCY1HH120J	24- 49	AA		C	
VCCCCY1HH180J	24- 50	AA		C	
VCCCCY1HH330J	24- 51	AA		C	
VCCCCY1HH470J	24- 52	AA		C	
“	24- 53	AA		C	
“	24- 54	AA		C	
“	24- 55	AA		C	
“	24- 56	AA		C	
VCEAGA1CW106M	24- 57	AA		C	
VCEAGA1CW107M	24- 58	AC		C	
VCEAGA1CW226M	24- 59	AB		C	
VCEAGA1CW476M	24- 60	AB		C	
VCEAGA1EW106M	24- 61	AA		C	
VCEAGA1EW476M	24- 62	AA		C	
VCEAGA1HW474M	24- 63	AB		C	
VCEAGA1VW106M	24- 64	AA		C	
VCEAGA1VW226M	24- 65	AC		C	
VCEAGA1VW476M	24- 66	AB		C	
VCKYCY1CF104Z	24- 67	AA		C	
“	24- 68	AA		C	
“	24- 69	AA		C	
“	24- 70	AA		C	
“	24- 71	AA		C	
VCKYCY1EB223K	24- 72	AA		C	
VCKYCY1HB102K	24- 73	AA		C	
“	24- 74	AA		C	
“	24- 75	AA		C	
“	24- 76	AA		C	
VCKYCY1HB222K	24- 77	AA		C	
VCKYCY1HB471K	24- 78	AB		C	
VCKYTW1HB104K	24- 79	AC		C	
VCQYNA1HM104K	24- 80	AB		C	
VHD1N4005E/-1	24- 81	AB		B	
VHDDA204K//--1	24- 82	AC		B	
VHDDAN202U/-1	24- 83	AB		B	
VHDDAP202U/-1	24- 84	AB		B	
VHDDSS133//--1	24- 85	AA		B	
VHi27C01014QS	24- 93	AX	N	B	
VHi27C02015QS	24- 93	AZ	N	B	
VHi27C02025QS	24- 93	AZ	N	B	
VHi341256SJ12	24- 1	AN		B	
VHi74VHC08/-1	24- 86	AE		B	
VHiH8S/2350FP	24- 87	AY		B	
VHiHG73C025FD	24- 88	BE		B	
VHiLM358PS/-S	24- 89	AC		B	
VHiM24C02WBN6	24- 90	AG		B	
VHiM51953BL-1	24- 91	AF		B	
VHiM66236FP-1	24- 92	AT		B	
VHiNJM2903M/-	24- 94	AD		B	
VHiNJM3414M-1	24- 95	AF		B	
VHiSLA7027MU/	24- 96	AQ		B	
VHiSN74LS07NS	24- 97	AF		B	
VHiTA7291S/-1	24- 98	AF		B	
VHiTC74HC14FN	24- 99	AH		B	
VHiTC74HC151F	24-100	AG		B	
VHiTD62503F/-	24-101	AG		B	
VHiULN2003AN1	24- 2	AE		B	
VHP1LHEE-002A	25- 14	AC		B	
VHP1LHLE-002A	25- 15	AC		B	
VHViCPN38//--1	24-102	AF		B	
VRS-CY1JD000J	24-103	AA		C	
VRS-CY1JD100J	24-104	AA		C	
VRS-CY1JD101J	24-105	AA		C	
VRS-CY1JD102F	24-106	AA		C	

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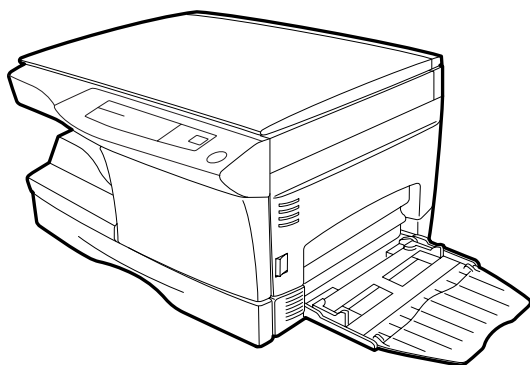
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1999 December Printed in Japan (N)

SHARP SERVICE MANUAL

CODE:00ZAL1000/A1E

DIGITAL COPIER



AL-1000 MODEL AL-1010

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Parts marked with "△" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

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CAUTION

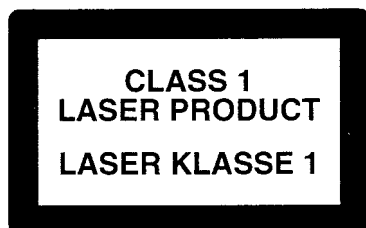
This product is a class 1 laser product that complies with 21CFR 1040.10 and 1040.11 of the CDRH standard and IEC825. This means that this machine does not produce hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eye's retina, there is the danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

- 1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not as individual parts.
- 2) Do not look into the machine with the main switch turned on after removing the developer unit, toner cartridge, and drum cartridge.
- 3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
- 4) The middle frame contains the safety interlock switch.

Do not defeat the safety interlock by inserting wedges or other items into the switch slot.



LASER WAVE – LENGTH : 780 ~ 795
Pulse times : 0.481ms/6mm
Out put power : 0.20 ± 0.03mW

CAUTION

INVISIBLE LASER RADIATION,
WHEN OPEN AND INTERLOCKS DEFEATED.
AVOID EXPOSURE TO BEAM.

VORSICHT

UNSICHTBARE LASERSTRAHLUNG,
WENN ABDECKUNG GEÖFFNET UND
SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT.
NICHT DEM STRAHL AUSSETZEN.

VARO !

AVATTAESSA JA SUOJALUKITUS
OHITETTAESSA OLET ALTTIINA
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE ÄLÄ
KATSO SÄTEESEEN.

ADVARSEL

USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR
SIKKERHEDSBRYDERE ER UDE AF
FUNKTION. UNDGÅ UDSÆTTELSE FOR
STRÅLNING.


VARNING !

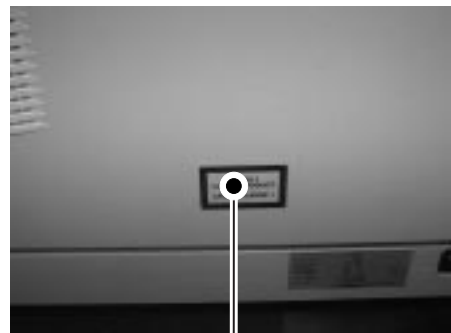
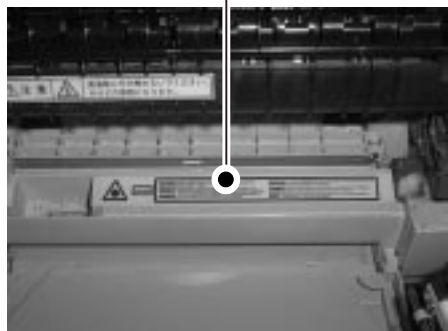
OSYNLIG LASERSTRÅLNING NÅR DENNA DEL
ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD.
BETRAKTA EJ STRÅLEN. – STRÅLEN ÄR
FÄRLIG.

At the production line, the output power of the scanner unit is adjusted to 0.57 MILLI-WATT PLUS 20 PCTS and is maintained constant by the operation of the Automatic Power Control (APC). Even if the APC circuit fails in operation for some reason, the maximum output power will only be 15 MILLI-WATT 0.1 MICRO-SEC. Giving and accessible emission level of 42 MICRO-WATT which is still-less than the limit of CLASS-1 laser product.

Caution

This product contains a low power laser device. To ensure continued safety do not remove any cover or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.

	Laserstrahl	CAUTION INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.	ADVERSE! USYNLIG LASERSTRÅLNING NÄR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
		VORSICHT UNSICHTBARE LASERSTRÄHLUNG WEENN ABOECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERERÜCKT. NICHT DEM STRAHL AUSSETZEN.	VARNING OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG. BETRAKTA EJ STRÅLEN.
		ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÄR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.	VARO! AVATTAESSA JA SUOJALUKUTUS OHITETTAESSA OLET ALLTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.



VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINITULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTÖMÄLLE LASERSÄTEILYLLE.

VARNING - OM APPARATEN ANVÄNDS PÅ ANNAT SÄTT ÄN I DENNA BRUKSANVISNING SPECIFICERATS, KAN ANVÄNDAREN UTSÄTTAS FÖR OSYNLIG LASERSTRÅLNING, SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

**CLASS 1
LASER PRODUCT
LASER KLASSE 1**

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

The foregoing is applicable only to the 220V model, 230V model and 240V model.

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[1] GENERAL

1. General

This model is a digital personal copier produced with key words of "Comfort able copy, Clear copy, Easy copy" providing high copy performances and copy productivity.

2. Target User Copy Volume: Monthly Average

Copies: 300 ~ 600 (Max. 800)

Prints: 300 ~ 600 (Max. 800)

3. Main features

(1) High-speed laser copying

- Since warm-up time is zero, copying can be started immediately after the power switch is turned on.
- First-copy time is only 9.6 seconds (normal mode).
- Copying speed is 10 copies/min., which adapts to business use, allowing improvement of working efficiency.

(2) High-quality digital image

- High-quality image copying at 600 dpi can be performed.
- In addition to the automatic exposure mode, the manual exposure can be adjusted in five steps.
- The photo mode copying function allows clear copying of delicate halftone original images such as monochrome photos and color photos.

(3) Substantial copying functions

- Zoom copying from 50% to 200% in 1% increments can be performed.
- Continuous copying of maximum 99 sheets can also be performed.
- Toner save mode reduces toner consumption by approximately 10%.
- User programs allow setting/modification of functions for customer's needs.

4. Environmental

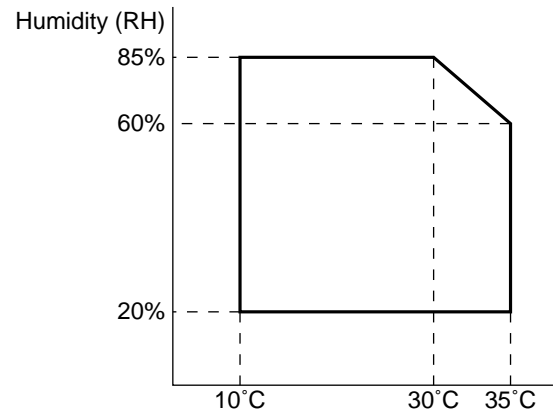
The environmental conditions for assuring the copy quality and the machine operations are as follows:

(1) Normal operating condition

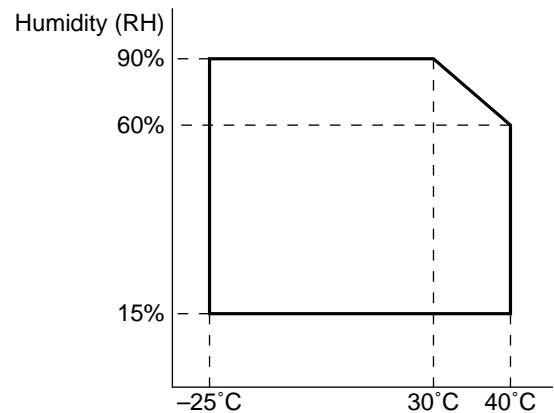
Temperature: 20°C ~ 25°C

Humidity: 65 ± 5% RH

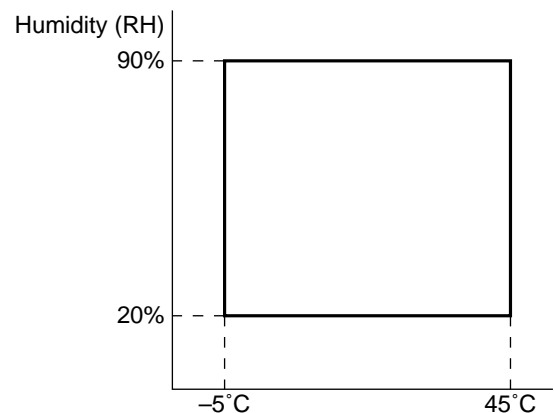
(2) Acceptable operating condition



(3) Optical condition



(4) Supply storage condition



[2] SPECIFICATIONS

1. Basic Specifications

item	
type	Desktop
Copy system	Dry, electrostatic
Segment (class)	Digital personal copier
External dimensions (W × D × H) (mm)	H293 × W518 × D445mm
Weight	Approx. 43.3lbs (19.6kg), TD and drum cartridges included

2. Operation specification

Section, item			Details	
Paper feed section	Paper feed system			1 tray (250 sheet) single bypass
				1tray (250 sheet) + multi bypass (50 sheet)
	AB system	Tray paper feed section	Paper size	A4, B5, A5 (Landscape)
			Paper weight	56 – 80g/m ²
			Paper feed capacity	250 sheets
			Kinds	Standard paper, specified paper, recycled paper
			Remark	User adjustment of paper guide available
		Multi bypass paper feed section	Paper size	A4, B5, A5, B6, A6 (Landscape)
			Paper weight	52 – 130g/m ²
			Paper feed capacity	50 sheets
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Postal card
			Remark	User adjustment of paper guide available
		Single bypass paper feed section	Paper size	A4, B5, A5, B6, A6 (Landscape)
			Paper weight	52 – 130g/m ²
			Paper feed capacity	1 sheet
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Postal card
			Remark	User adjustment of paper guide available
	Inch system	Tray paper feed section	Paper size	8-1/2" × 14", 8-1/2 × 11", 8-1/2" × 5-1/2" (Landscape)
			Paper weight	15 – 21 lbs.
			Paper feed capacity	250 sheets
			Kinds	Standard paper, specified paper, recycled paper
			Remark	User adjustment of paper guide available
		Multi bypass paper feed section	Paper size	8-1/2" × 14", 8-1/2 × 11", 8-1/2" × 5-1/2", 3-1/2" × 5-1/2" (Landscape)
			Paper weight	14 – 34.5 lbs.
			Paper feed capacity	50 sheets
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Postal card
			Remark	User adjustment of paper guide available
		Single bypass paper feed section	Paper size	8-1/2" × 14", 8-1/2 × 11", 8-1/2" × 5-1/2" (Landscape)
			Paper weight	14 – 34.5 lbs.
			Paper feed capacity	1 sheet
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Postal card
			Remark	User adjustment of paper guide available

Section, item		Details	
Paper exit section	Exit way		Face down
	Capacity of output tray		100 sheets
Originals	Original set		Center Registration (left edge)
	Max. original size		B4 (10" × 14")
	Original kinds		sheet, book
	Original size detection		None
Optical section	Scanning section	Scanning system	CCD sensor scanning by lighting lamp scanner
		CCD sensor	Resolution
		Lighting lamp	Type
			Xenon lamp
			Voltage
			1.5kV
			Power consumption
			11 ± 3W
	Writing section	Writing system	Writing to OPC drum by the semiconductor laser
		Laser unit	Resolution
			600 dpi
	Gradation		256 gradations/8bit
Image forming	Photoconductor	type	OPC (30φ)
		Life	18k
	Charger	Charging system	Saw -tooth charging with a grid, / (–) scorotron discharge
		Transfer system	(+) DC corotron system
		Separation system	(–) DC corotron system
	Developing	Developing system	Dry, 2-component magnetic brush development system
	Cleaning	Cleaning system	Counter blade system (Counter to rotation)
Fusing section	Fusing system		Heat roller system
	Upper heat roller	type	Teflon roller
	Lower heat roller	type	Silicon rubber roller
	heater lamp	type	Halogen lamp
		Voltage	100V
		Power consumption	800W
Electrical section	Power source	Voltage	100V, 110V, 120/127V, 230V, 240V
		Frequency	Common use for 50 and 60Hz
	Power consumption	Max.	1000W
		Average (during copying)	260Wh/H *1)
		Average (stand-by)	70Wh/H *1)
		Pre-heat mode	40Wh/H *1)
		Auto power shut-off mode	18Wh/H *1)

*1) May fluctuate due to environmental conditions and the input voltage.

3. Copy performance

Section, item		Details	
Copy magnification	Fixed magnification ratios		3R + 2E (AB system : 50, 70, 81, 100, 141, 200%) (Inch system : 50, 64, 78, 129, 100, 200%)
	Zooming magnification ratios		50 ~ 200% (151 steps in 1% increments)
Manual steps (manual, photo)			5 steps
Copy speed	First copy time	Tray paper feed	9.6 sec. (Pre-heat mode:16 sec. or below / Auto power-shut-off mode : 23 sec. or below)
	AB system : A4 (Landscape)	Copy speed (CPM)	Manual paper feed
			Single : 10.0 sec. / Multi : 8.0sec (Pre-heat mode:16 sec. or below / Auto power-shut-off mode : 23 sec. or below)
			Same size
			10
			Enlargement
			10
			Reduction
			10
	B5 (Landscape)	Copy speed (CPM)	Same size
			10
			Enlargement
			10
			Reduction
			10
	Inch system 8-1/2" × 14" (Landscape)	Copy speed (CPM)	Same size
			10
			Enlargement
	8-1/2" × 11" (Landscape)	Copy speed (CPM)	10
			Same size
			10
			Enlargement
			10
			Reduction
			10
Max. continuous copy quantity			99
Void	Void area	leading edge	1 ~ 4mm
		Trailing edge	4mm or less
		Side edge void area	3mm or less/per side
	Image loss	leading edge	same size: 3.0mm or less / Enlarge (200%): 1.5mm or less / Reduction (50%): 6.0mm or less
		Trailing edge	same size: 3.0mm or less / Enlarge (200%): 1.5mm or less / Reduction (50%): 6.0mm or less
		Side edge void area	same size: 3.0mm or less / Enlarge (200%): 1.5mm or less / Reduction (50%): 6.0mm or less
Warm-up time			0 sec.
Power save mode reset time			0 sec.
Paper jam recovery time			0 sec.

4. Others

Section, item		Remark						
Additional function	Toner save mode	Can be set or canceled with user simulation.		Yes				
	Pre-heat mode	Can be set or canceled with user simulation.		Yes				
	Auto power shut off mode	Can be set or canceled with user simulation.		Yes				
Accessories								
	Subsidiaries	SEC	SECL	SEEG	SUK	SCA	EX AB	EX Inch
	Tray (Universal)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Drum cartridge	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	TD cartridge	Yes	Yes	Yes	Yes	Yes	No*	No*
	AC power cord	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Tool for corona cleaning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Operation manual	English1	English1 French	QB/QE: Multi language	English2	English2	Ex.) English French Arabic	Ex.) English Spanish
*Except some								

[3] CONSUMABLE PARTS

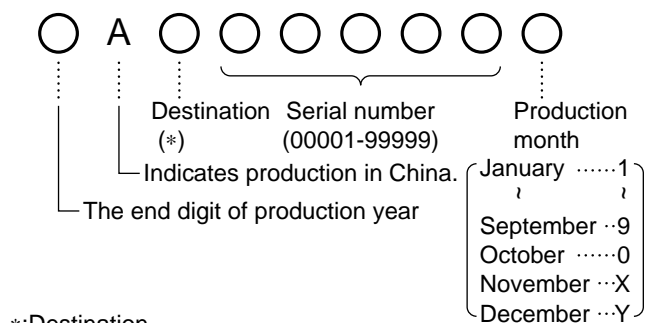
1. Supply system table

Common to all destinations

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) × 1	Toner/developer cartridge × 1 (Toner: Net weight 220g) (Developer: Net weight 190g)	6K (5% document)	AL-100TD	5
2	Drum cartirdge	Drum cartridge	18K	AL-100R	5

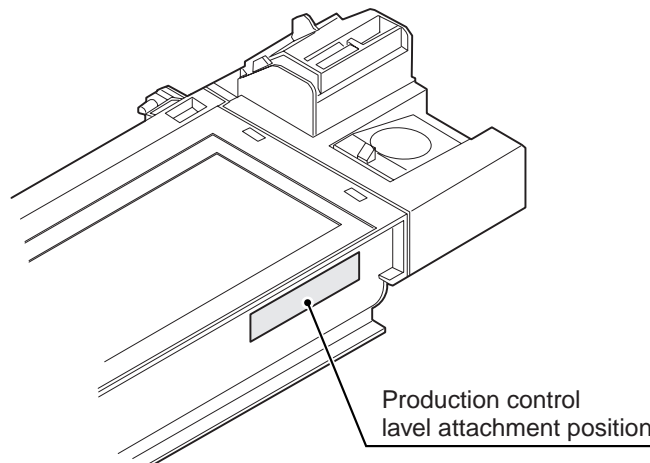
2. Production control number(lot No.) identification

〈Developing cartridge〉



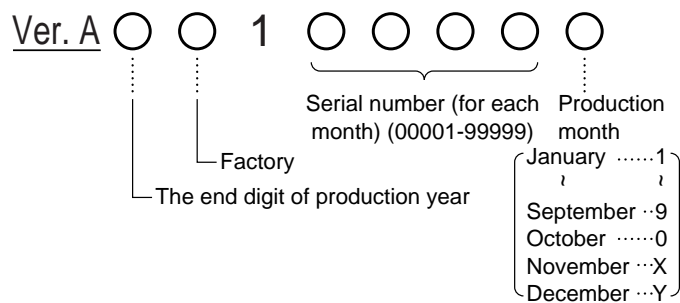
*:Destination

Division	No.
Japan option	1
Ex option	2
Japan, same pack	6
Ex, same pack	7

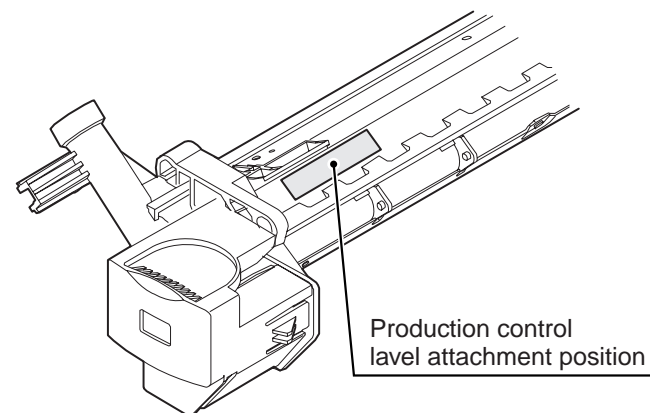


〈Drum cartridge〉

The label on the drum cartridge shows the date of production.

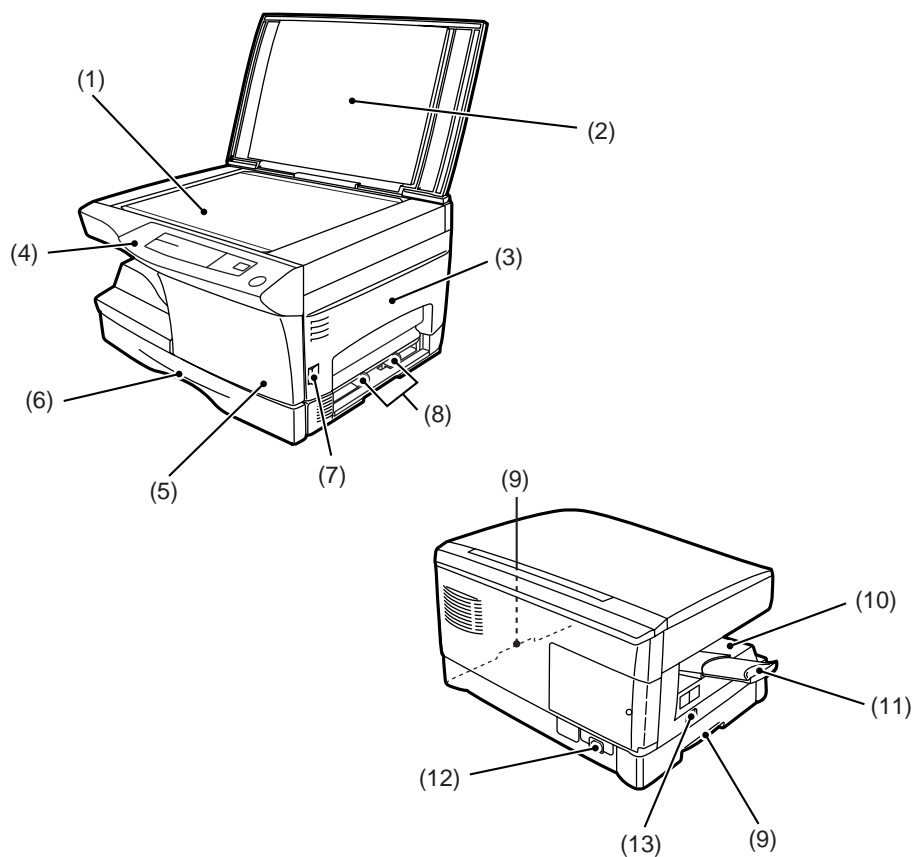


Division	No.
Ex production	1
Option	2
Same pack	3



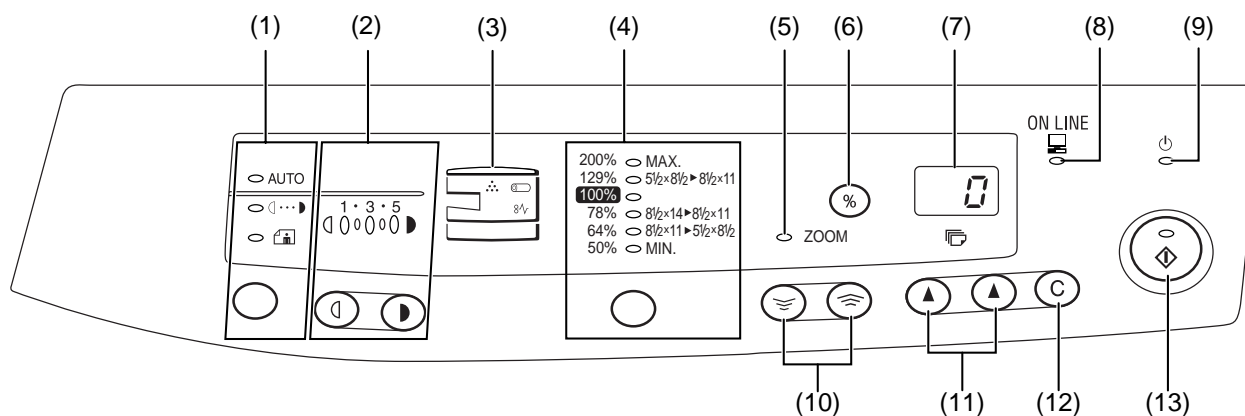
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



(1)	Original table	(2)	Original cover	(3)	Side cover
(4)	Operation panel	(5)	Front cover	(6)	Paper tray
(7)	Side cover open button	(8)	Paper guides	(9)	Handle
(10)	Paper output tray	(11)	Paper output tray extension	(12)	Power cord socket
(13)	Power switch				

2. Operational panel



(1)	Exposure mode selector key and indicators	(2)	Light and dark keys and exposure indicators	(3)	Alarm indicators ^{*1}
(4)	Copy ratio selector key and copy ratio indicators	(5)	Zoom indicator	(6)	Copy ratio display (%) key
(7)	Display	(8)	ON LINE indicator	(9)	Power save indicator
(10)	Zoom keys	(11)	Copy quantity keys	(12)	Clear key
(13)	Print key and ready indicator				

*1

Drum replacement required indicator

When the drum counter reaches 17,000 copies, the indicator lights up. After 1,000 additional copies are made, the indicator starts blinking and machine will hard-stop (after current job) until a new cartridge is installed.

Misfeed indicator

TD cartridge replacement required indicator

When toner density is lower than a specified level, the TONER DEVELOPER CARTRIDGE REPLACEMENT indicator lights up to warn the user.

If toner is not added after approximately 10 sheets are copied, the indicator starts blinking and machine starts to supply toner. (Toner Developer cartridge replacement indicator keeps lighting up)

If toner density is not back to specific level after two minutes, the READ indicator goes out and Toner Developer indicator starts blinking, and the copier stops.

*2 ON: Indicates that the machine is in the energy saving (pre-heat) mode.

Blink: Indicates that the machine is in the process of resetting from the energy saving mode or just after supplying the power.

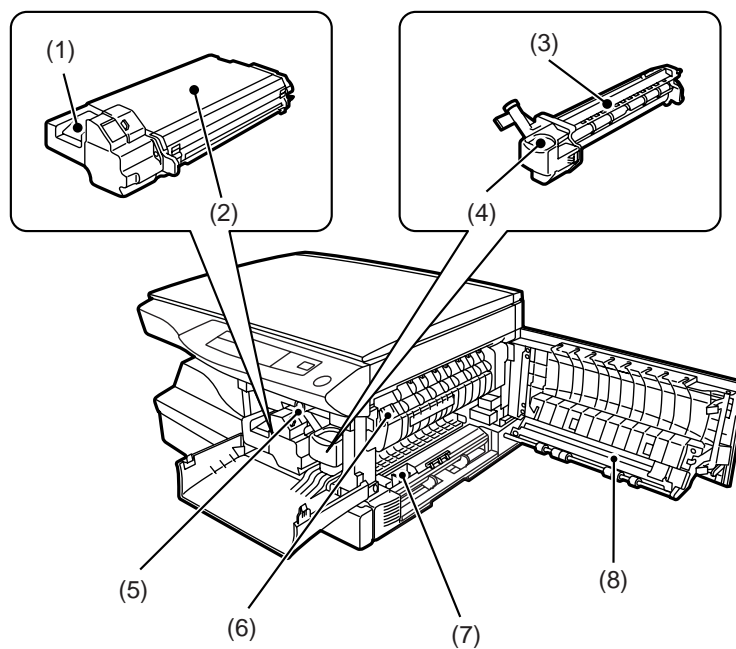
OFF: Indicates that resetting from the energy saving mode is completed and that the fusing temperature is in ready state.

The combinations of the above display lamps are as follows: (● = ON, X = OFF)

Lamp	Immediately after power ON	Ready	Copying
Pre-heat lamp	Blink	X	X
Ready lamp	●	●	X
Other lamps	●	●	●

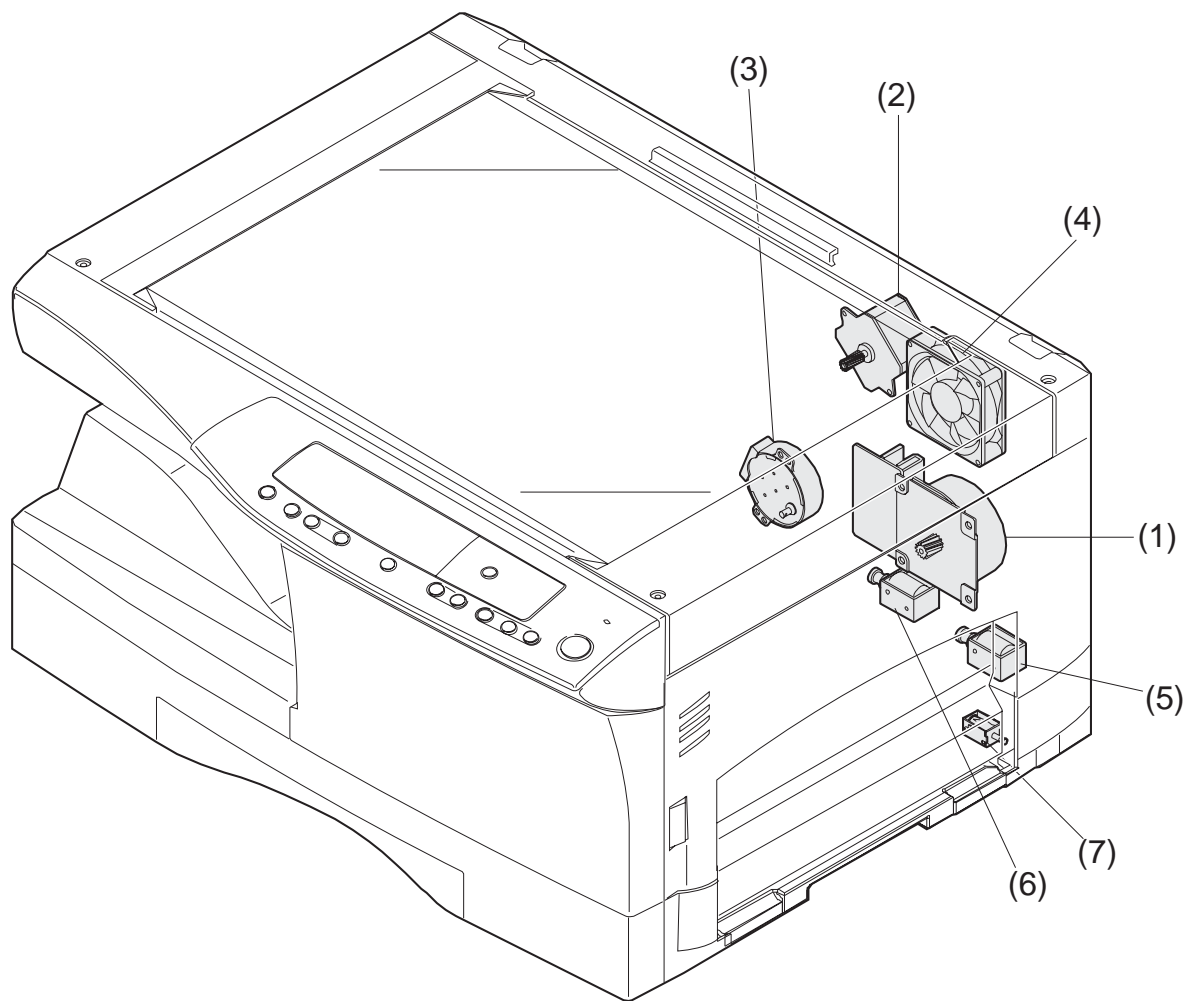
Lamp	Energy saving mode (Pre-heating)	Energy saving mode (Auto power shut off)	Resetting from energy saving mode	Copy is started during resetting from energy saving mode
Pre-heat lamp	●	●	Blink	Blink
Ready lamp	●	X	●	X
Other lamps	●	X	●	●

3. Internal



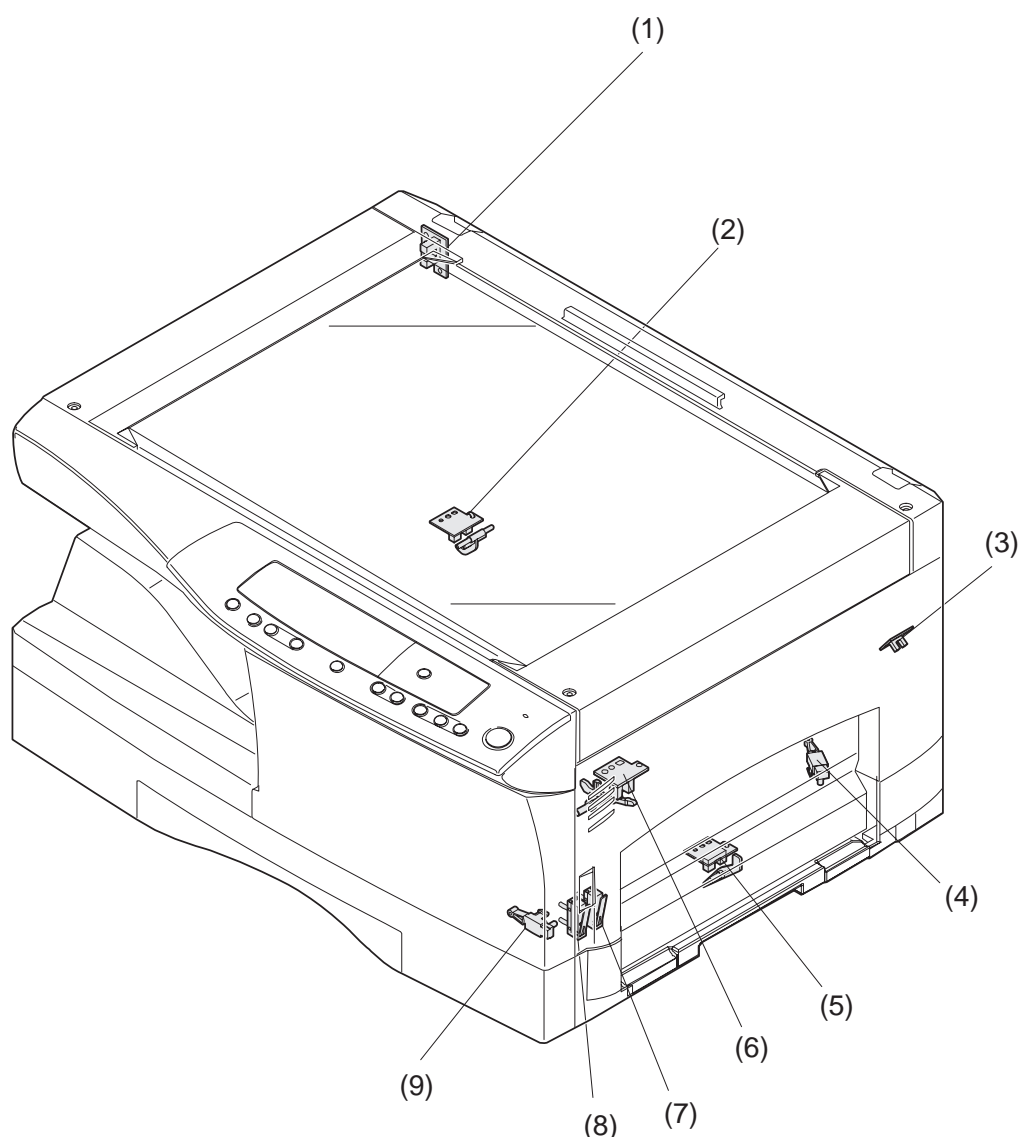
(1)	TC cartridge lock release button	(2)	TD cartridge	(3)	Drum cartridge
(4)	Drum cartridge handle	(5)	Paper feed roller	(6)	Fusing unit release lever
(7)	Charger cleaner	(8)	Transfer charger		

4. Motors and solenoids



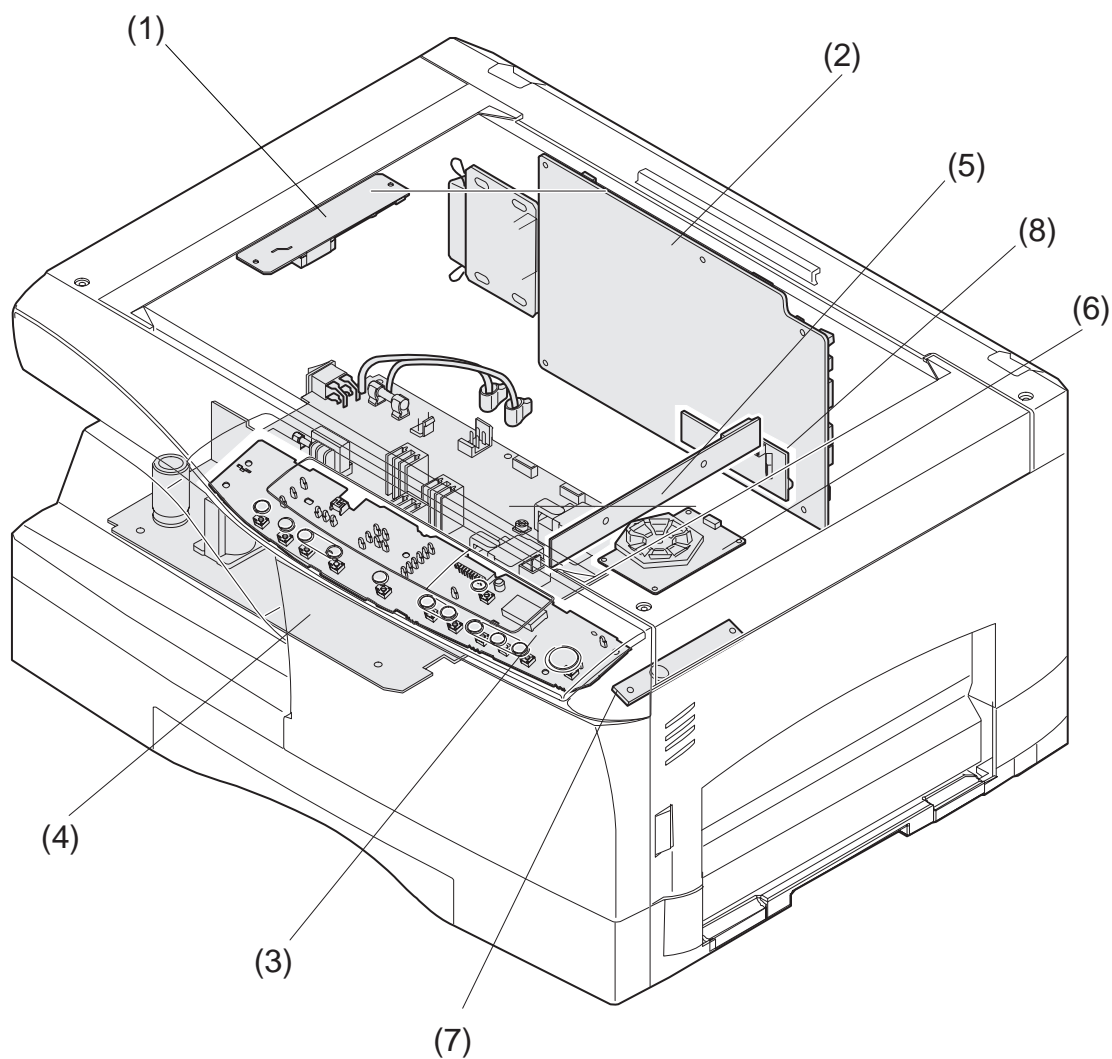
No.	Part name	Control signal	Function,operation
(1)	Main motor	MM	Drives the copier.
(2)	Mirror motor	MRMT	Drives the optical mirror base (scanner unit).
(3)	Toner motor	TM	Supplies toner.
(4)	Cooling fan motor	VFM	Cools the optical section.
(5)	Resist roller solenoid	RRS	Resist roller rotation control solenoid
(6)	Paper feed solenoid	CPFS1	Cassette Paper feed solenoid
(7)	Multi paper feed solenoid	MPFS	Multi manual pages feed solenoid

5. Sensors and switches



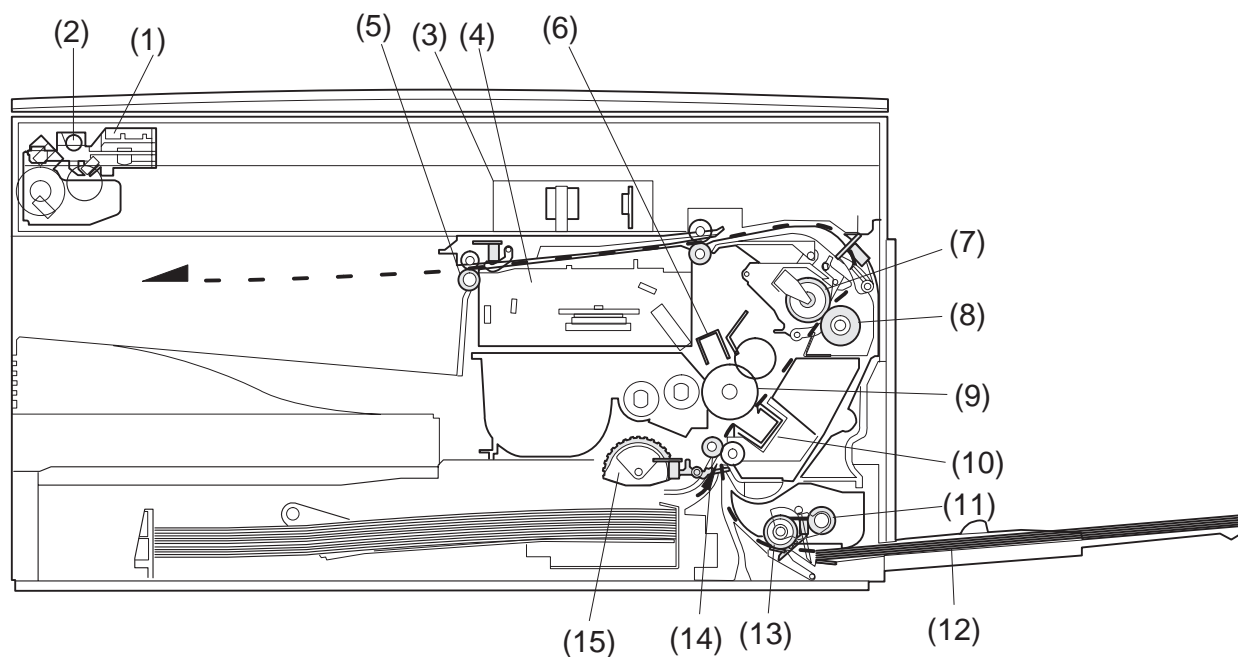
No.	Name	Signal	Type	Function	Output
(1)	Mirror home position sensor	MHPS	Transmission sensor	Mirror (scanner unit) home position detection	"H" at home position
(2)	POD sensor	POD	Transmissions sensor	Paper exit detection	"H" at paper pass
(3)	PPD2 sensor	PPD2	Transmission sensor	Paper transport detection 2	"L" at paper pass
(4)	Cassette detection switch	CED1	Microswitch	Cassette installation detection	"H" at cassette insertion
(5)	Manual feed detection switch	MFD	Transmission sensor	Manual feed paper detection (single only)	"L" at paper detection
(6)	PPD1 sensor	PPD1	Transmission sensor	Paper transport detection 1	"L" at paper pass
(7)	Door switch	DSW	Micro switch	Door open/close detection (safety switch for 5V)	1 or 0V of 5V at door open
(8)	Door switch	DSW	Micro switch	Door open/close detection (safety switch for 24V)	1 or 0V of 24V at door open
(9)	Drum reset switch	DRST	Micro switch	New drum detection switch	Instantaneously "H" at insertion of new drum

6. PWB unit



No.	Name	Function
(1)	Exposure lamp inverter PWB	Exposure lamp (Xenon lamp) control
(2)	Main PWB (MCU)	Copier control
(3)	Operation PWB	Operation input/display
(4)	Power PWB	AC power input, DC voltage control, High voltage control
(5)	CCD sensor PWB	For image scanning
(6)	LSU motor PWB	For polygon motor drive
(7)	TCS PWB	For toner sensor control
(8)	LSU PWB	For laser control

7. Cross sectional view



No.	Part name	Function and operation
(1)	Scanner unit	Illuminates the original with the copy lamp and passes the reflected light to the lens unit (CCD).
(2)	Exposure lamp	Exposure lamp (Xenon lamp) Illuminates original
(3)	Lens unit	Scans the original image with the lens and the CCD.
(4)	LSU (Laser unit)	Converts the original image signal into laser beams and writes onto the drum.
(5)	Paper exit roller	Roller for paper exit
(6)	Main charger	Provides negative charges evenly to the drum surface.
(7)	Heat roller	Fuses toner on the paper. (Teflon roller)
(8)	Pressure roller	Fuses toner on the paper. (Silicon rubber roller)
(9)	Drum	Forms images.
(10)	Transfer unit	Transfers images onto the drum.
(11)	Pickup roller	Picks up the manual feed paper. (In multi feed only)
(12)	Manual paper feed tray	Tray for manual feed paper
(13)	Manual paper feed roller	Transport the paper from the manual paper feed port.
(14)	PS roller unit	Takes synchronization between the lead edge and the rear edge of the paper.
(15)	Paper feed roller	Picks up a sheet of paper from the cassette.

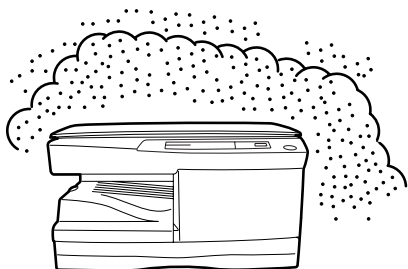
[5] UNPACKING AND INSTALLATION

1. A WORD ON COPIER INSTALLATION

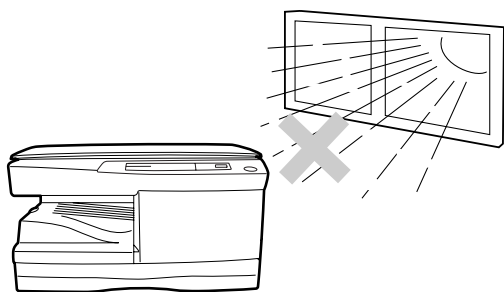
Improper installation may damage the copier. Please note the following during initial installation and whenever the copier is moved.

Do not install your copier in areas that are:

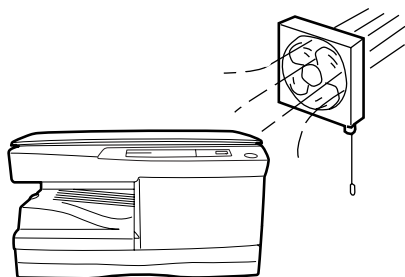
- damp, humid, or very dusty



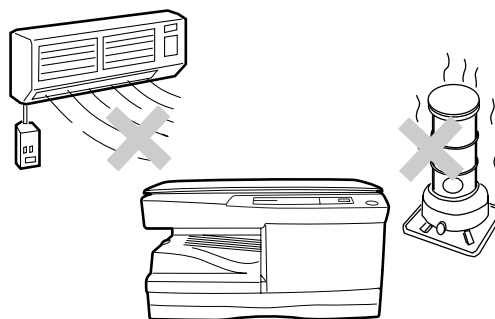
- exposed to direct sunlight



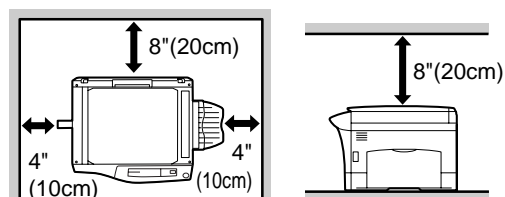
- poorly ventilated



- subject to extreme temperature or humidity changes, e.g., near an air conditioner or heater.

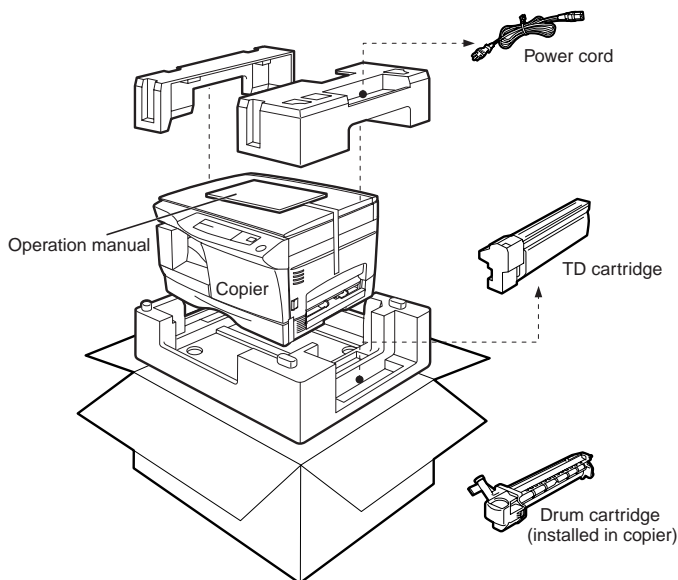


Be sure to allow the required space around the machine for servicing and proper ventilation.



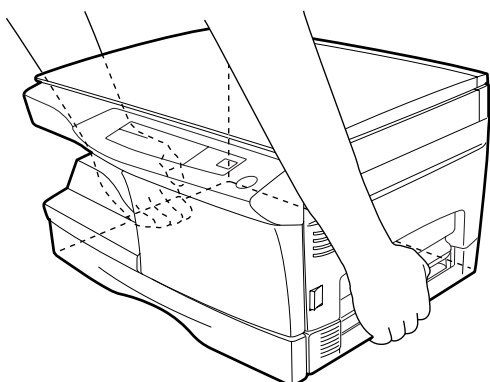
2. CHECKING PACKED COMPONENTS AND ACCESSORIES

Open the carton and check if the following components and accessories are included.



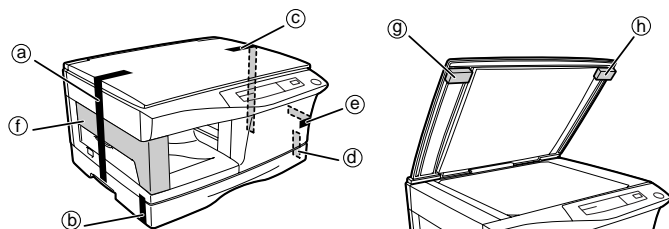
3. UNPACKING

Unpack the copier and carry it to the installation location by holding the handles on both sides of the copier.

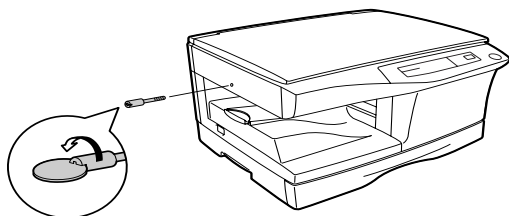


4. REMOVING PROTECTIVE PACKING MATERIALS

(1) Remove pieces of tape (a), (b), (c), (d), (e), (f), (g) and (h) and protective cover (i). Then open the original cover and remove protective materials (j) and (k).

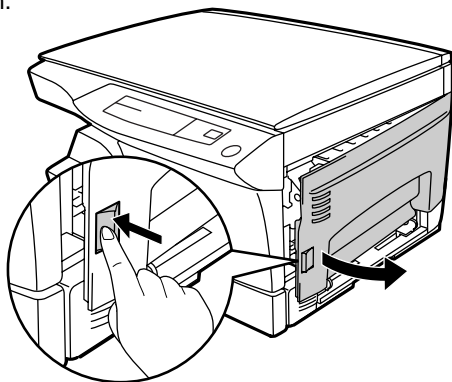


(2) Use a coin (or suitable object) to remove the screw. Store the screw in the paper tray because it will be used if the copier has to be moved.

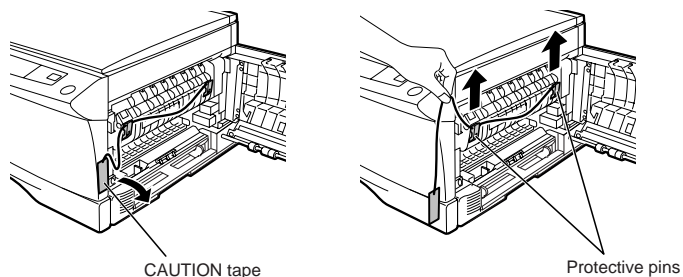


5. INSTALLING THE TD CARTRIDGE

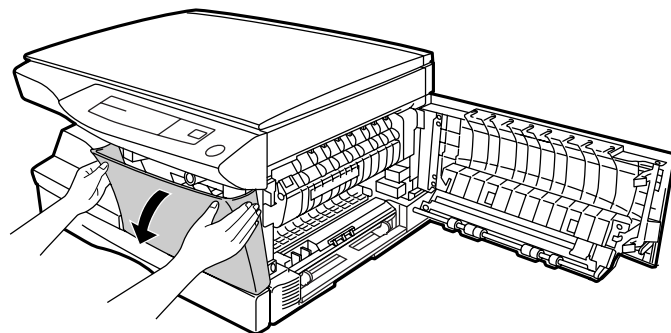
(1) Open the side cover while pressing the side cover open button.



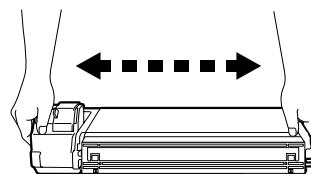
(2) Remove the CAUTION tape from the front cover and remove the two protective pins from the fusing unit by pulling the strings upward one at a time.



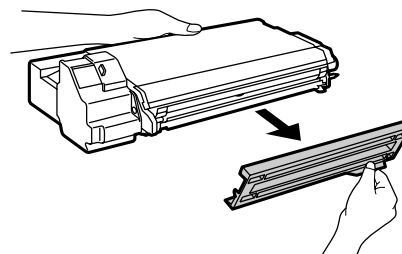
(3) Push gently on both sides of the front cover to open the cover.



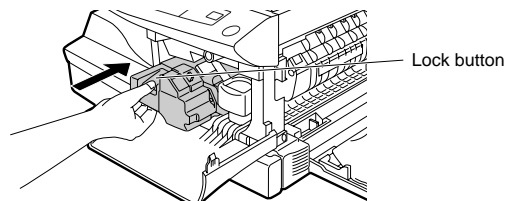
(4) Remove the TD cartridge from the bag. Remove the protective paper. Hold the cartridge on both sides and shake it horizontally four or five times.



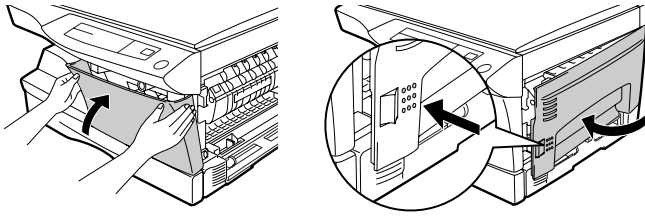
(5) Hold the tab of the protective cover and pull the tab to your side to remove the cover.



(6) Gently insert the TD cartridge until it locks in place, while pushing the lock button.

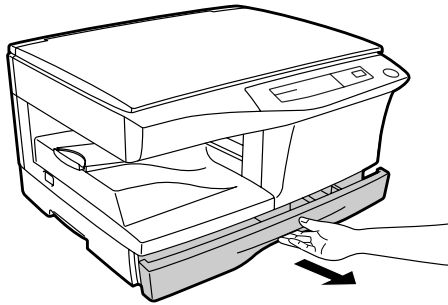


- (7) Close the front cover and then the side cover by pressing the round projections near the side cover open button.

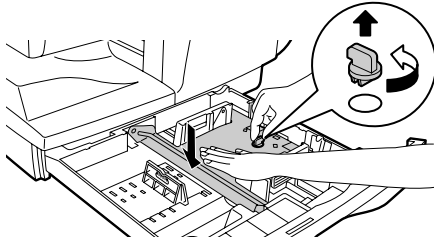


6. LOADING COPY PAPER (installing the paper tray)

- (1) Raise the handle of the paper tray and pull the paper tray out until it stops.

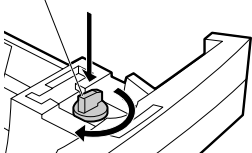


- (2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down the pressure plate of the paper tray.

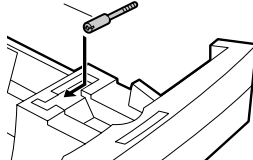


- (3) Store the pressure plate lock which has been removed in step 2 and the screw which has been removed when unpacking (see page 5-2, step 2 of REMOVING PROTECTIVE PACKING MATERIALS) in the front of the paper tray. To store the pressure plate lock, rotate the lock to fix it on the relevant location.

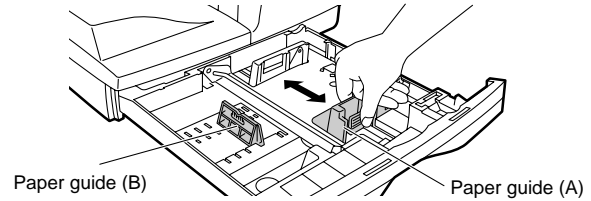
Pressure plate lock



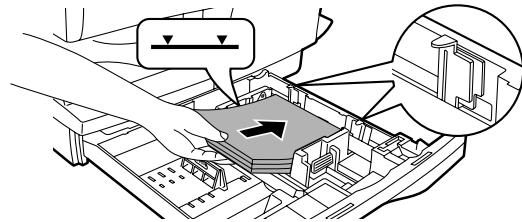
Screw



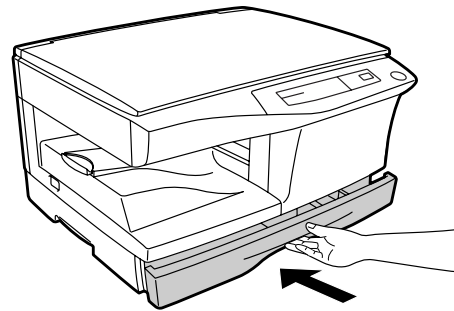
- (4) Adjust the paper guides on the paper tray to the copy paper width and length. Squeeze the lever of paper guide (A) and slide the guide to match with the width of the paper. Move paper guide (B) to the appropriate slot as marked on the tray.



- (5) Fan the copy paper and insert it into the tray. Make sure the edges go under the corner hooks.

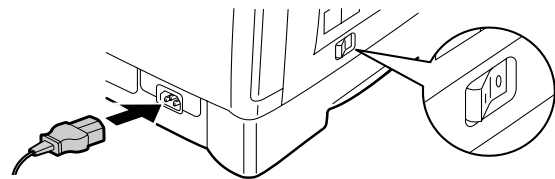


- (6) Gently push the paper tray back into the copier.



7. PLUGGING IN THE COPIER

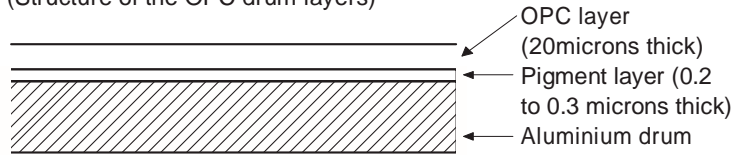
- (1) Ensure that the power switch of the copier is in the OFF position. Insert the attached power cord into the power cord socket at the rear of the copier.



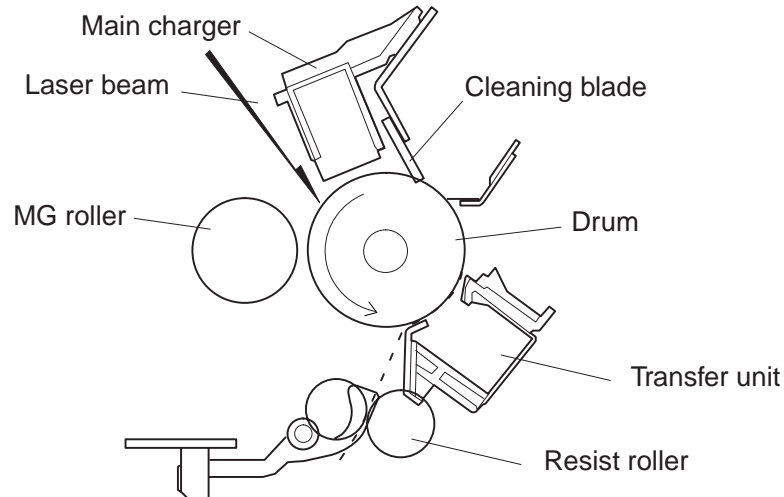
- (2) Plug the other end of the power cord into the nearest outlet.

[6] Printing process

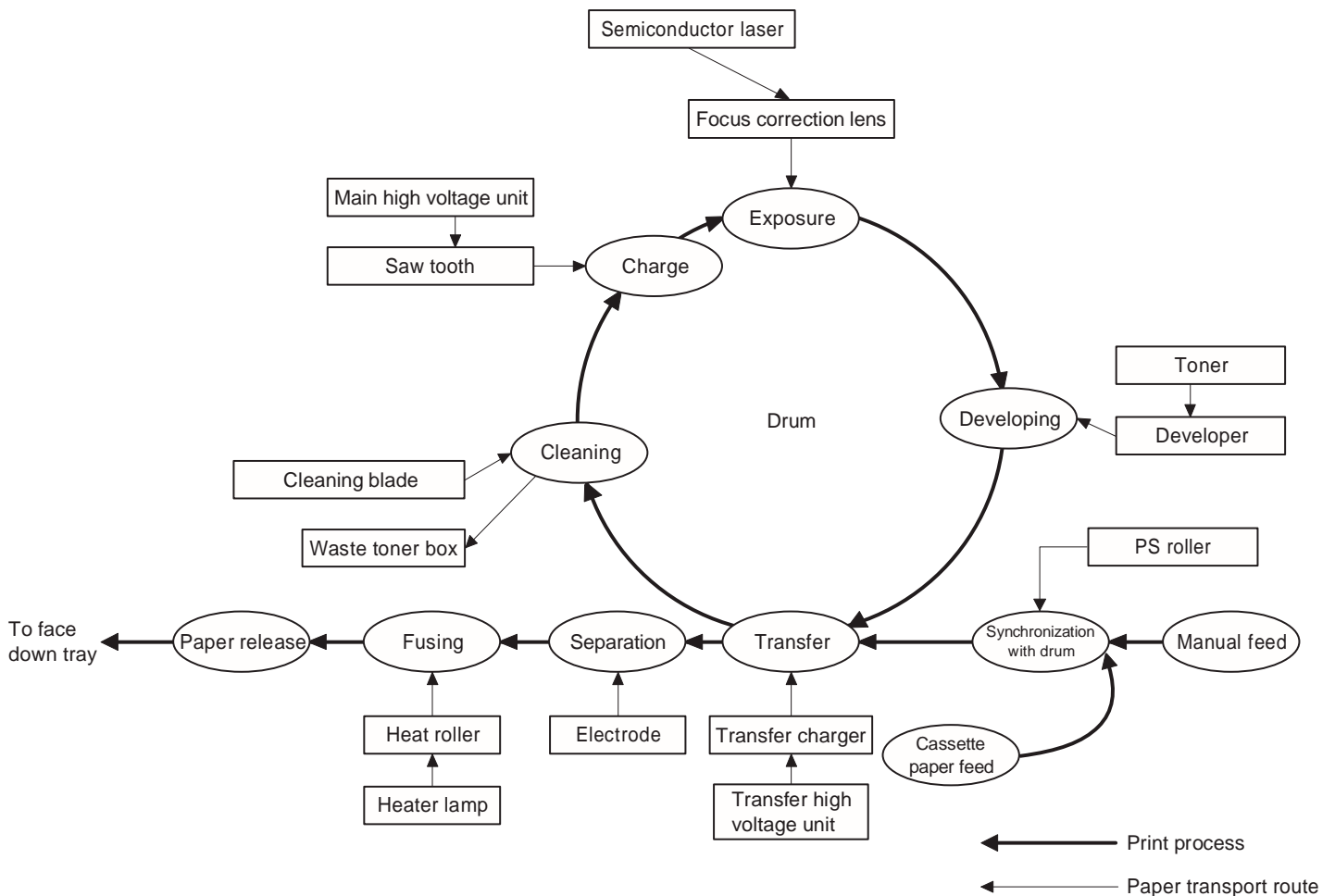
An OPC drum is used for the photoconductor.
(Structure of the OPC drum layers)



(1) Functional diagram



(Basic operation cycle)



(2) Outline of print process

This printer is a non-impact printer that uses a semiconductor laser and electrostatic print process. This printer uses an OPC (Organic Photo Conductor) for its photoconductive material. First, voltage from the main corona unit charges the drum surface and a latent image is formed on the drum surface using a laser beam. This latent image forms a visible image on the drum surface when toner is applied. The toner image is then transferred onto the print paper by the transfer corona and fused on the print paper in the fusing section with a combination of heat and pressure.

Step-1: Charge

Step-2: Exposure

* Latent image is formed on the drum.

Step-3: Developing

Latent image formed on the drum is then changed into visible image with toner.

Step-4: Transfer

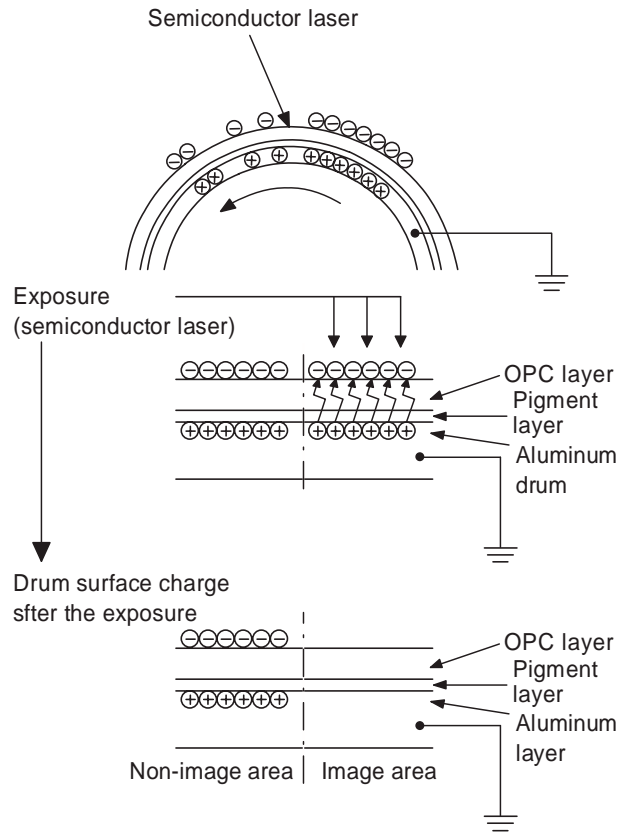
The visible image (toner image) on the drum is transferred onto the print paper.

Step-5: Cleaning

Residual toner on the drum surface is removed and collected by the cleaning blade.

Step-6: Optical discharge

Residual charge on the drum surface is removed, by semiconductor laser beam.

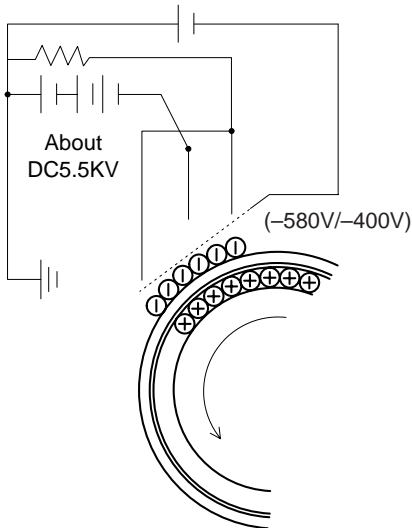


(3) Actual print process

Step-1: DC charge

A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger.

Positive charges are generated in the aluminum layer.



Step-2: Exposure (laser beam, lens)

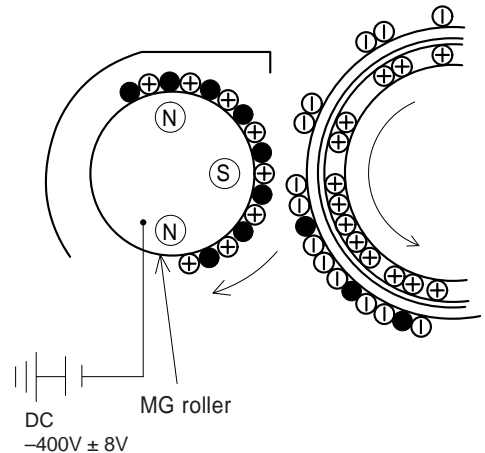
A Laser beam is generated from the semiconductor laser and controlled by the print pattern signal. The laser writes onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal). The beam neutralizes the negative charge. An electrostatic latent image is formed on the drum surface.

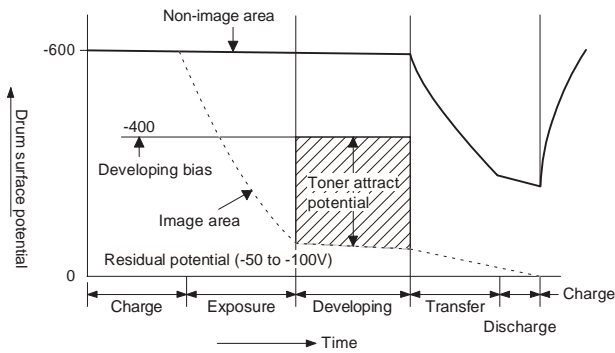
Step-3: Developing (DC bias)

A bias potential is applied to the MG roller in the two component magnetic brush developing method, and the toner is charged negative through friction with the carrier.

Non-image area of the drum surface charged with negative potential repel the toner, whereas the laser exposed portions where no negative charges exist, attract the toner. As a result, a visible image appears on the drum surface.

- ⊕ : Carrier (Magnetized particle)
- : Toner (Charge negative by friction)
- (N) (S) : Permanent magnet (provided in three locations)

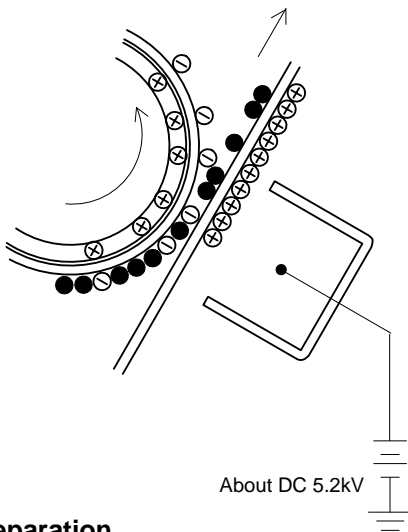




Toner is attracted over the shadowed area because of the developing bias.

Step-4: Transfer

The visible image on the drum surface is transferred onto the print paper by applying a positive charge from the transfer corona to the backside of the print paper.

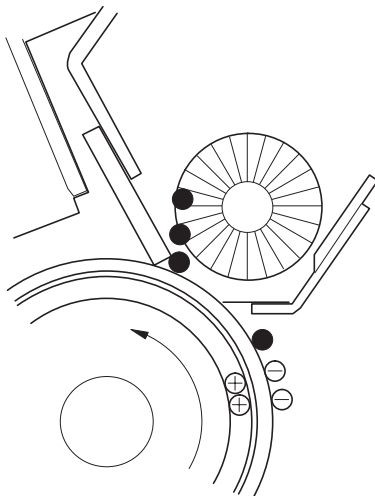


Step-5: Separation

Since the print paper is charged positively by the transfer corona, it is discharged by the separation corona. The separation corona is connected to ground.

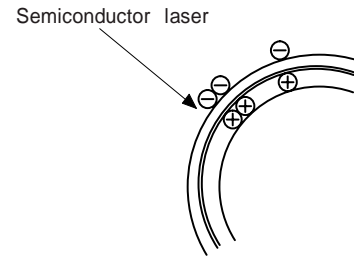
Step-6: Cleaning

Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



Step-7: Optical discharge (Semiconductor laser)

Before the drum rotation is stopped, the semiconductor laser is radiated onto the drum to reduce the electrical resistance in the OPC layer and eliminate residual charge, providing a uniform state to the drum surface for the next page to be printed. When the electrical resistance is reduced, positive charges on the aluminum layer are moved and neutralized with negative charges on the OPC layer.



Charge by the Scorotron charger

Function

The Scorotron charger functions to maintain the surface potential of the drum even at all times which. It is used to control the surface potential regardless of the charge characteristics of the photoconductor.

Basic function

A screen grid is placed between the saw tooth and the photoconductor. A stable voltage is added to the screen grid to maintain the corona current on the photoconductor.

As the photoconductor is charged by the saw tooth from the main corona unit, the surface potential increases. This increases the current flowing through the screen grid. When the photoconductor potential nears the grid potential, the current turns to flow to the grid so that the photoconductor potential can be maintained at a stable level.

Process controlling

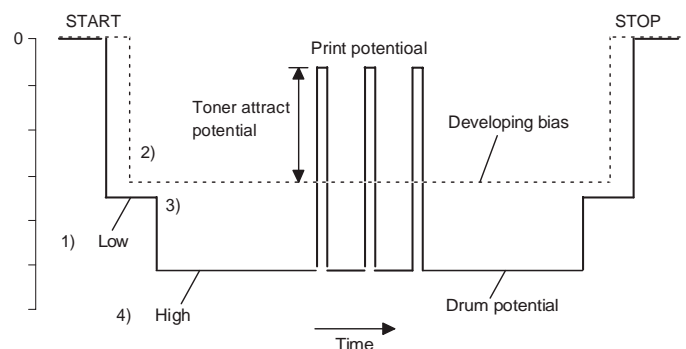
Function

The print pattern signal is converted into an invisible image by the semiconductor laser using negative to positive (reversible) developing method. Therefore, if the developing bias is added before the drum is charged, toner is attracted onto the drum. If the developing bias is not added when the drum is charged, the carrier is attracted to the drum because of the strong electrostatic force of the drum.

To avoid this, the process is controlled by adjusting the drum potential and the grid potential of the Scorotron charger.

Basic function

Voltage added to the screen grid can be selected, high and low. To make it easily understood, the figure below shows voltage transition at the developer unit.



Start

- 1) Because the grid potential is at a low level, the drum potential is at about -400V . (Carrier may not be attracted though the carrier is pulled towards the drum by the electrostatic force of -400V .)
- 2) Developing bias (-400V) is applied when the photoconductor potential is switched from LOW to HIGH.
- 3) Once developing bias (-400V) is applied and the photoconductor potential rises to HIGH, toner will not be attracted to the drum.

Stop

The reverse sequence takes place.

Retaining developing bias at an abnormal occurrence

Function

The developing bias will be lost if the power supply was removed during print process. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates a function to retain the developing bias for a certain period and decrease the voltage gradually against possible power loss.

Basic function

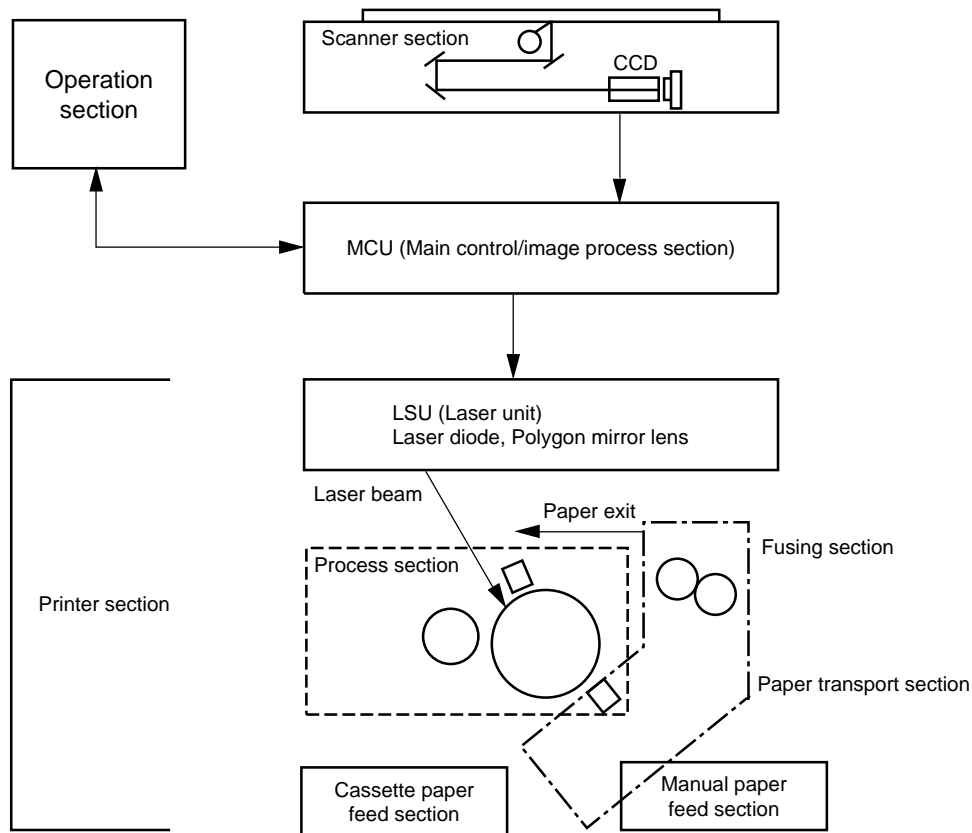
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not make a deposit on the drum surface.

[7] OPERATIONAL DESCRIPTIONS

(1) Outline of operation

The outline of operation is described referring to the basic configuration.

(Basic configuration)



Outline of copy operation

Setting conditions

- 1) Set copy conditions such as the copy quantity and the copy density with the operation section, and press the COPY button. The information on copy conditions is sent to the MCU.

Image scanning

- 2) When the COPY button is pressed, the scanner section starts scanning of images. The light from the copy lamp is reflected by the document and passed through the lens to the CCD.

Photo signal/Electric signal conversion

- 3) The image is converted into electrical signals by the CCD circuit and passed to the MCU.

Image process

- 4) The document image signal sent from the CCD circuit is processed under the revised conditions and sent to the LSU (laser unit) as print data.

Electric signal/Photo signal (laser beam) conversion

- 5) The LSU emits laser beams according to the print data. (Electrical signals are converted into photo signals.)
- 6) The laser beams are radiated through the polygon mirror and various lenses to the OPC drum.

Printing

- 7) Electrostatic latent images are formed on the OPC drum according to the laser beams, and the latent images are developed to be visible images (toner images).
- 8) Meanwhile the paper is fed to the image transfer section in synchronization with the image lead edge.
- 9) After the transfer of toner images onto the paper, the toner images are fused to the paper by the fusing section. The copied paper is discharged onto the exit tray.

(2) Scanner section

1) How to scan documents

The scanner has sensors that are arranged in a line. These sensors scan a certain area of a document at a time and deliver outputs sequentially. When the line is finished, the next line is scanned, and this procedure is repeated. The figure below shows the case where the latter two sections of an image which are scanned are shown with solid lines and the former two sections which are being transmitted are shown with dotted lines.

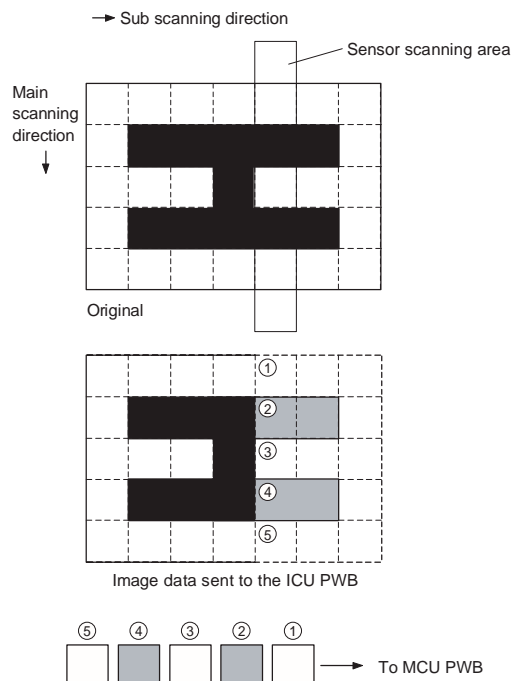
The direction of this line is called "main scanning direction," and the scanning direction "sub scanning direction."

In the figure above, one line is divided into 4 sections. Actually, however, one line is divided into thousands of sections. For scanning, the light receiving element called CCD is used.

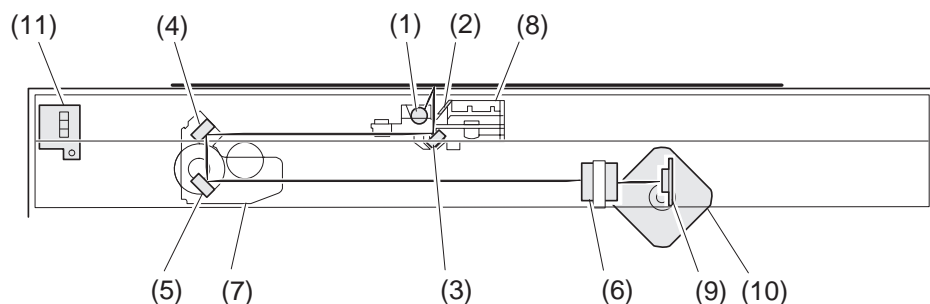
The basic resolution indicates the scanner capacity. The basic resolution is expressed in dpi (dot/inch) which shows the number of light emitting elements per inch on the document.

The basic resolution of this machine is 400dpi.

In the sub scanning direction, at the same time, the motor that drives the optical system is controlled to scan the image at the basic resolution.



2) Basic structure of scanner section



1	Copy lamp (Xenon lamp)	2	Reflector (light conversion plate)	3	No. 1 mirror
4	No. 2 mirror	5	No. 3 mirror	6	Lens
7	No. 2/3 mirror unit	8	Copy lamp unit	9	CCD
10	Mirror motor	11	MHPS (Mirror home position sensor)		

The scanner unit performs scanning in the digital optical system.

The light from the light source (Xenon lamp) is reflected by a document and passed through three mirrors and reduction lenses to the CCD element (image sensor) where images are formed. This system is known as the reduction image sensor system. Photo energy on the CCD element is converted into electrical signals (analog signals). (Photo-electric conversion). The output signals (analog signals) are converted into digital signals (A/D conversion) and passed to the MCU (main control/image process section). The resolution at that time is 400dpi.

The mirror unit in the scanner section is driven by the mirror motor.

The MHPS is provided to detect the home position of the copy lamp unit.

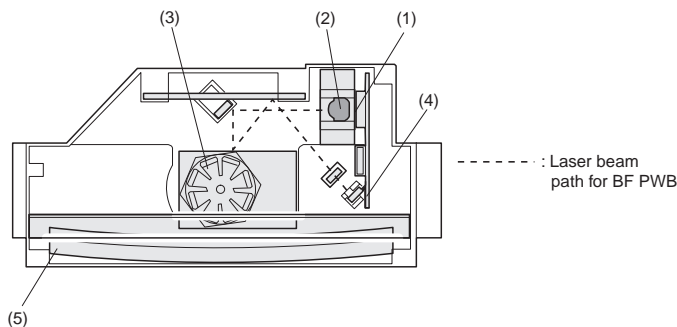
(3) Laser unit

The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

1) Basic structure

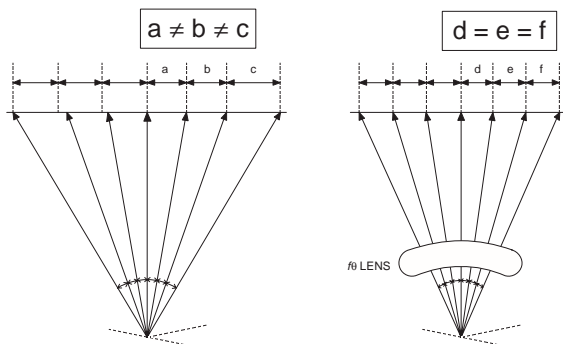
The LSU unit is the writing section of the digital optical system. The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and f θ lens, etc.

The laser beams are passed through the collimator lens, the polygon mirror, the f θ lens, and the mirror to form images on the OPC drum in the main scanning direction. The laser emitting PWB is provided with the APC (auto power control) in order to eliminate fluctuations in the laser power. The BF PWB works for measurement of the laser writing start point.

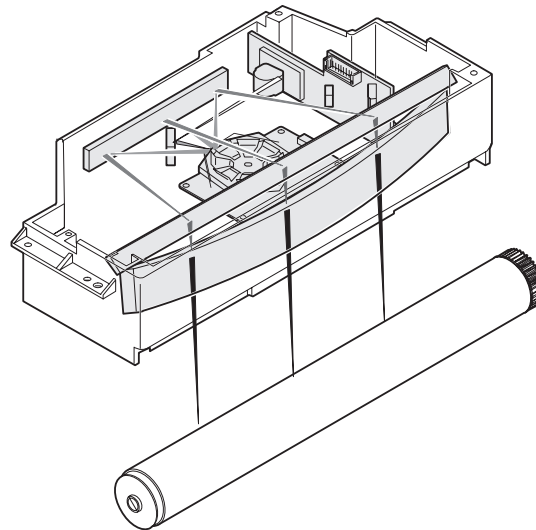


No.	Component	Function
(1)	Semiconductor laser	Generates laser beams.
(2)	Collimator lens	Converges laser beams in parallel.
(3)	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm.
(4)	BD (Mirror, lens, PWB)	Detects start timing of laser scanning.
(5)	f θ lens	Converges laser beams at a spot on the drum. Makes the laser scanning speeds at both ends of the drum same as each other. (Refer to the figure below.)

Makes the laser scanning speeds at both ends of the drum same as each other.



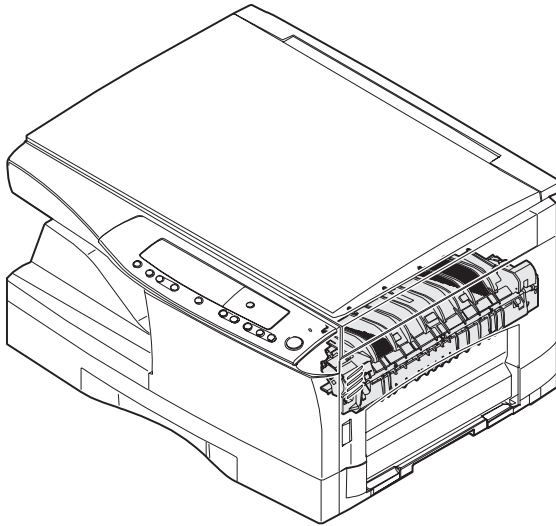
2) Laser beam path



3) Composition

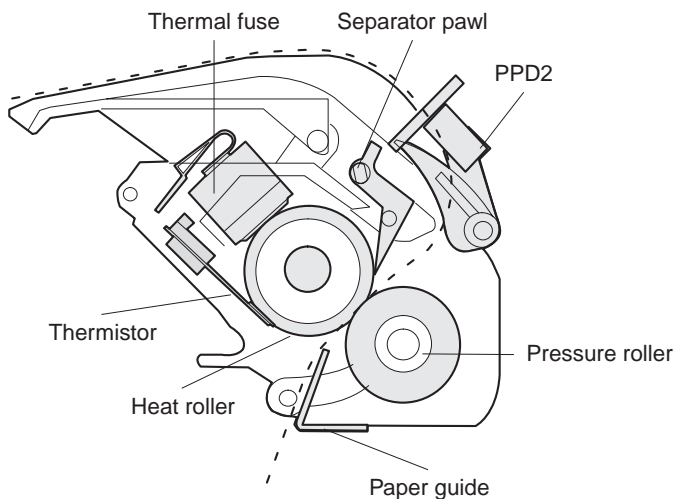
Effective scanning width:	216mm (max.)
Resolution:	600dpi
Beam diameter:	75 μ m in the main scanning direction, 80 μ m in the sub scanning direction
Image surface power:	0.20 \pm 0.03mW (Laser wavelength 780 – 795nm)
Polygon motor section:	Brushless motor 20.787rpm No. of mirror surfaces: 6 surfaces

Fuser section

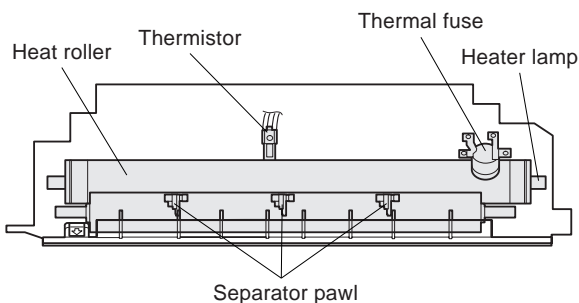


1. General description

General block diagram (cross section)



Top view



A. Heat roller

A pressure roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

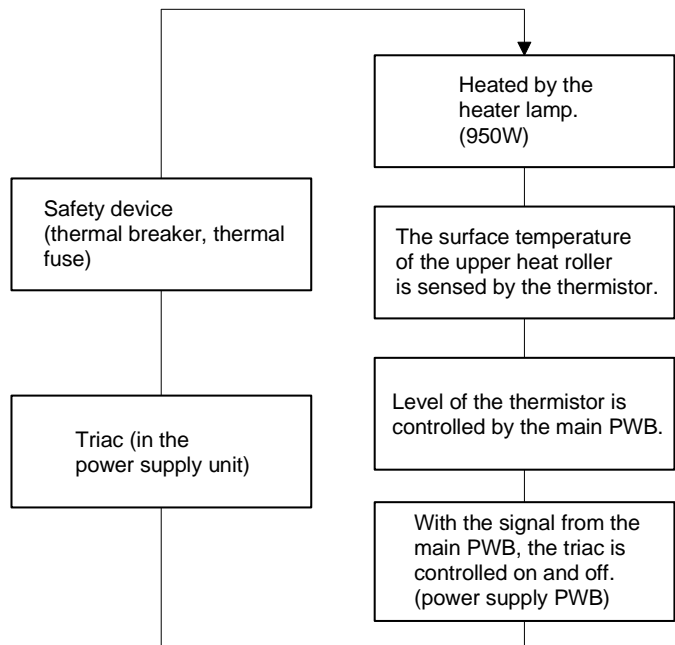
B. Separator pawl

Three separator pawls are used on the upper heat roller. The separator pawls are teflon coated to reduce friction with the roller and prevent a smear on the paper caused by the separator pawl.

C. Thermal control

1. The heater lamp, thermistor, main PWB, DC power supply PWB, and triac within the power supply unit are used to control the temperature in the fuser unit.

To prevent against abnormally high temperature in the fuser unit, a thermal breaker and thermal fuse are used for safety purposes.



2. The surface temperature of the upper heat roller is set to 165°C ~ 190°C. The surface temperature during the power save mode is set to 100°C.
3. The self-check function comes active when one of the following malfunctions occurs, and an "H" is displayed on the multicopy window.
 - a. When the heat roller surface temperature rises above 240°C.
 - b. When the heat roller surface temperature drops below 100°C during the copy cycle.
 - c. Open thermistor
 - d. Open thermal fuse
 - e. When the heat roller temperature does not reach 190°C within 27 second after supplying the power.

D. Fusing resistor

Fusing resistor

This model is provided with a fusing resistor in the fusing section to improve transfer efficiency.

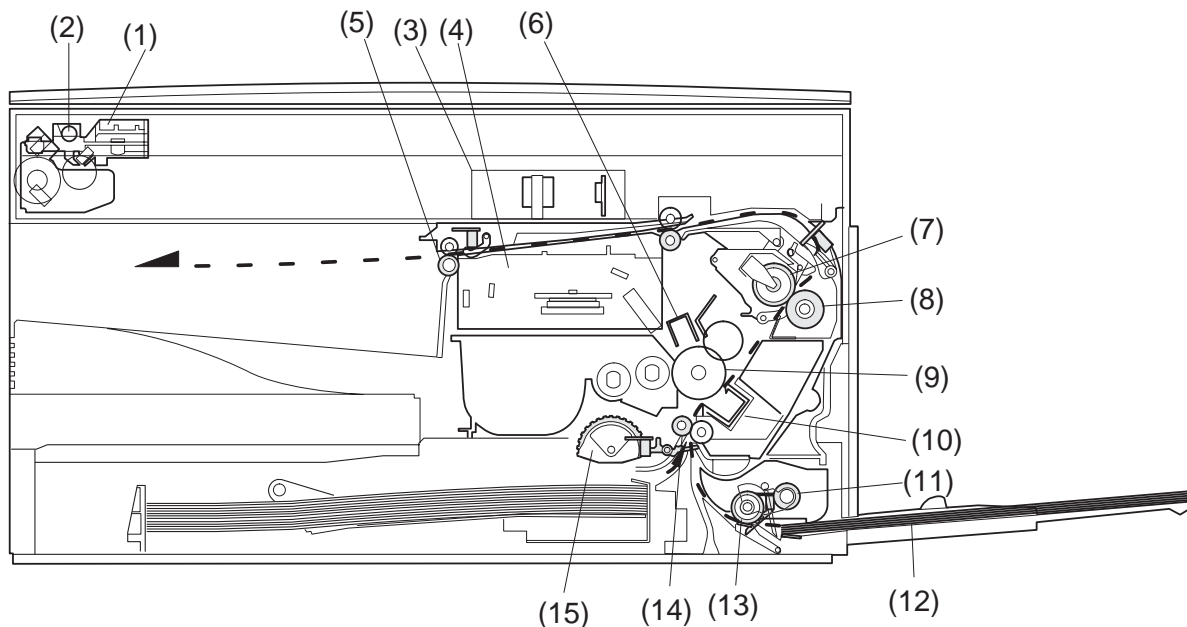
General descriptions are made in the following.

General descriptions

Since the upper heat roller is conductive when copy paper is highly moistured and the distance between the transfer unit and the fusing unit is short, the transfer current leaks through the copy paper, the upper heat roller and the discharging brush.

Paper feed section and paper transport section

1. Paper transport path and general operations



(1)	Scanner unit	(6)	Main charger	(11)	Pickup roller
(2)	Copy lamp	(7)	Heat roller	(12)	Manual paper feed tray
(3)	Lens unit	(8)	Pressure roller	(13)	Manual paper feed roller
(4)	LSU (Laser unit)	(9)	Drum	(14)	PS roller unit
(5)	Paper exit roller	(10)	Transfer unit	(15)	Paper feed roller

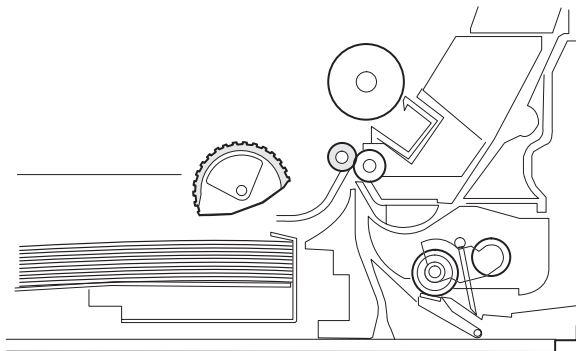
Paper feed is made in two ways; the tray paper feed and the manual paper feed. The tray is of universal-type, and has the capacity of 250 sheets. The front loading system allow you to install or remove the tray from the front cabinet.

The general descriptions on the tray paper feed and the manual paper feed are given below.

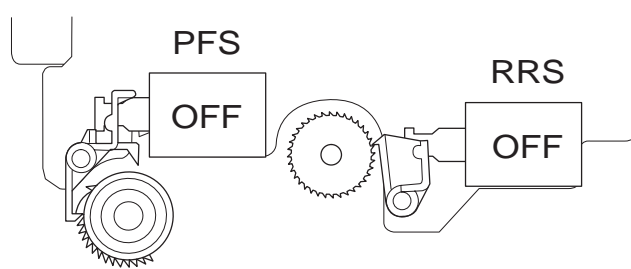
A. Cassette paper feed operation

1. The figure below shows the positions of the pick-up roller, the paper feed clutch sleeve, and the paper feed latch in the initial state without pressing the COPY button after lighting the ready lamp.

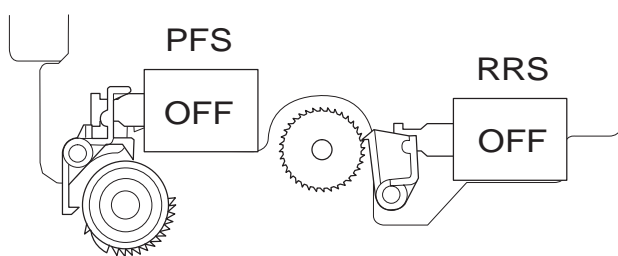
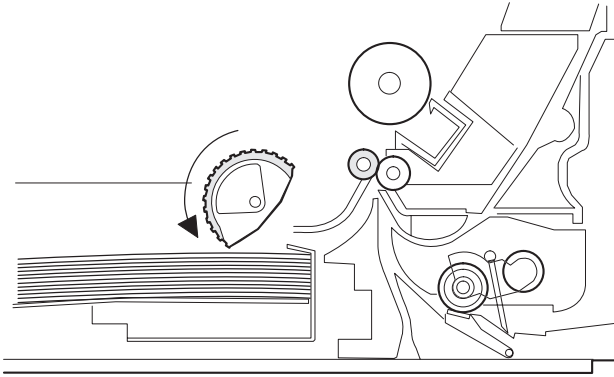
The paper feed latch is in contact with the projection of the clutch sleeve.



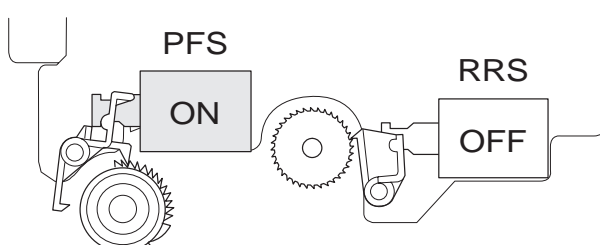
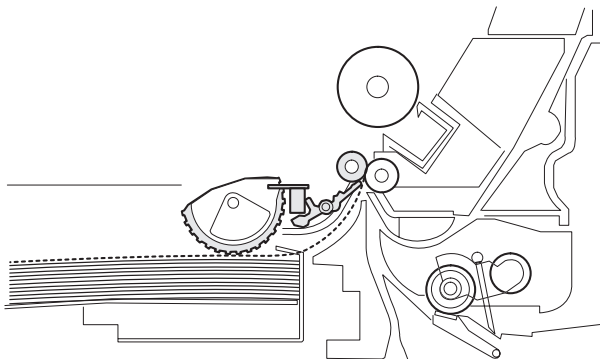
2. When the COPY button is pressed, the main drive motor starts rotating to drive each drive gear. The pick-up drive gear also is driven at that time. Since, however, the paper feed latch is in contact with the projection of the clutch sleeve, rotation of the drive gear is not transmitted to the pick-up roller, which does not rotate therefore.



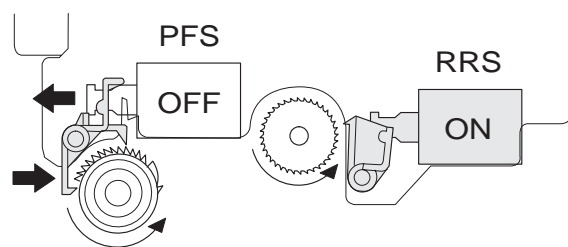
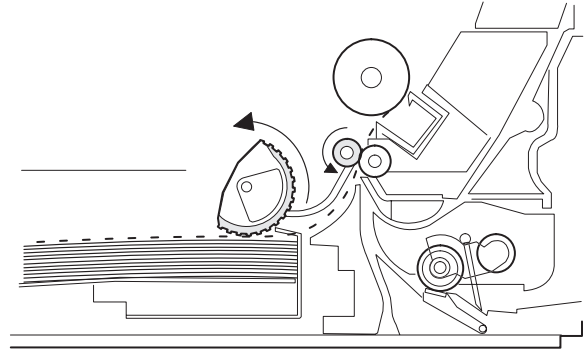
3. After about 0.1 sec from when the main motor start rotating, the tray paper feed solenoid (PFS) turns on at a moment. This disengages the paper feed latch from the projection of the clutch sleeve, transmitting rotation of the pick-up drive gear to the paper feed roller shaft, rotating the pick-up roller to feed the paper.



4. After more than half rotation of the pick-up roller, the paper feed latch is brought in contact with the projection of the clutch sleeve, stopping rotation of the pick-up roller.
5. At this time, the paper is fed passed the paper entry detection switch (PPD1), and detected by it. After about 0.15 sec from detection of paper by PPD1, the tray paper feed solenoid (PFS) turns on so that the clutch sleeve projection comes into contact with the paper feed latch to stop the pick-up roller. Then the pick-up roller rotates for about 0.15 sec so that the lead edge of the paper is evenly pressed on the resist roller, preventing against skew feeding.



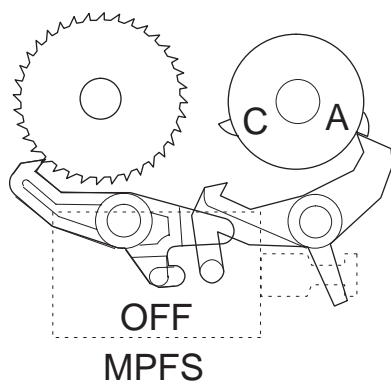
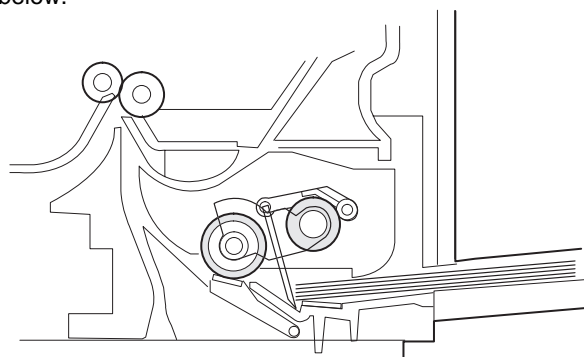
6. To release the resist roller, the tray paper feed solenoid and the resist solenoid are turned on by the paper start signal to disengage the resist start latch from the clutch sleeve projection, transmitting rotation of the resist drive gear to the resist roller shaft. Thus the paper is transported by the resist roller.
7. After the resist roller starts rotating, the paper is passed through the pre-transfer guide to the transfer section. Images are transferred on the paper, which is separated from the OPC drum by the drum curve and the separation section.



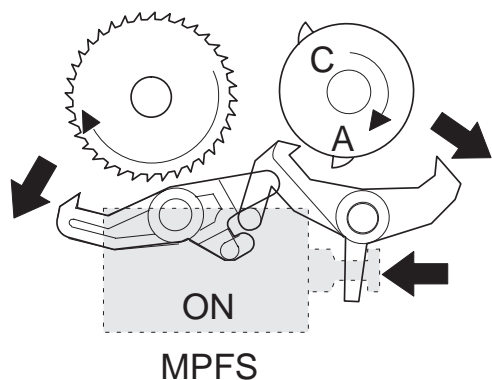
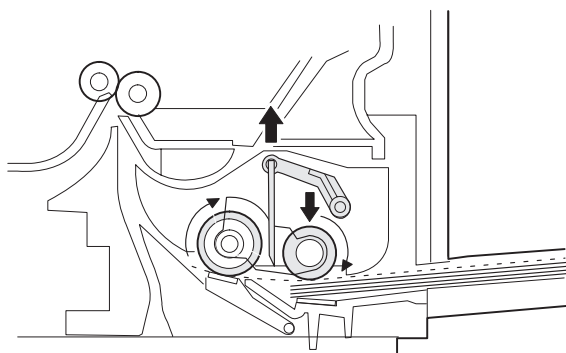
8. The paper separated from the drum is passed through the fusing paper guide, the heat roller (fusing section), POD (paper out detector) to the copy tray.

B. Manual multi paper feed operation

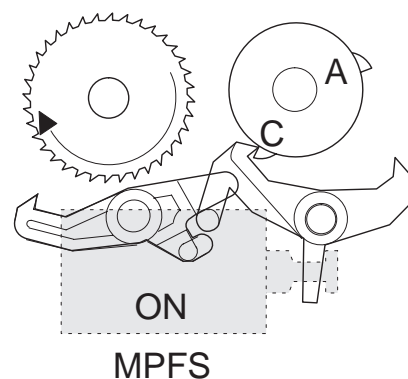
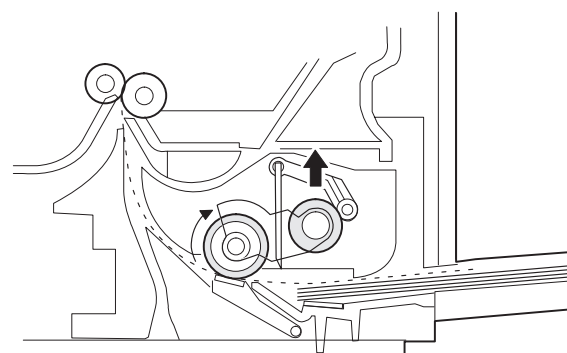
1. Before paper feed operation, the manual paper feed solenoid (MPFS) is turned OFF as shown in the figure below.



2. When the PRINT button is pressed, the manual paper feed solenoid (MPFS) turns on to disengage the manual paper feed latch A from the manual paper feed clutch sleeve A, rotating the manual paper feed roller and the manual take-up roller. At the same time, the manual paper feed stopper opens and the manual take-up roller is pressed to the surface of the paper to start paper feeding.

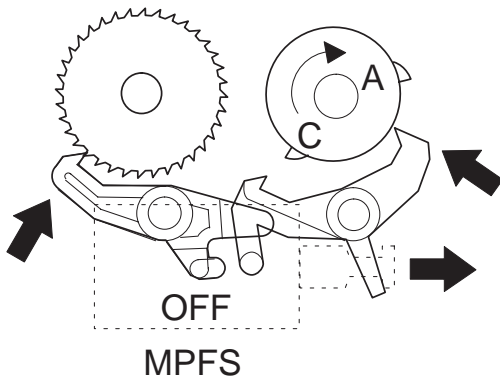
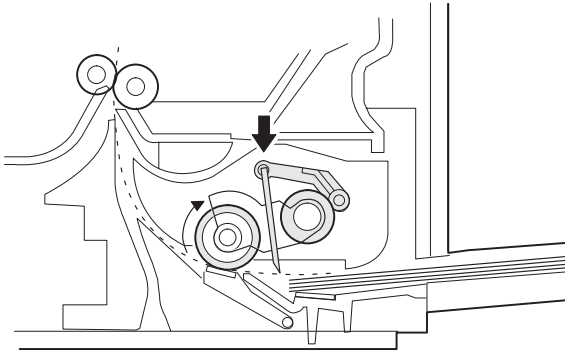


3. When pawl C of the manual paper feed clutch sleeve is hung on the manual feed latch, the manual feed stopper falls and the manual take-up roller rises. At that time, the manual paper feed roller is rotating.



4. The lead edge of the transported paper is pressed on the resist roller by the transport roller. Then the paper is stopped temporarily to make synchronization with the lead edge of the image on the OPC drum. The operations hereinafter are the same as the paper feed operations from the tray. (Refer to A-5 ~ 8.)

5. The solenoid turns off to close the gate and return to the initial state.

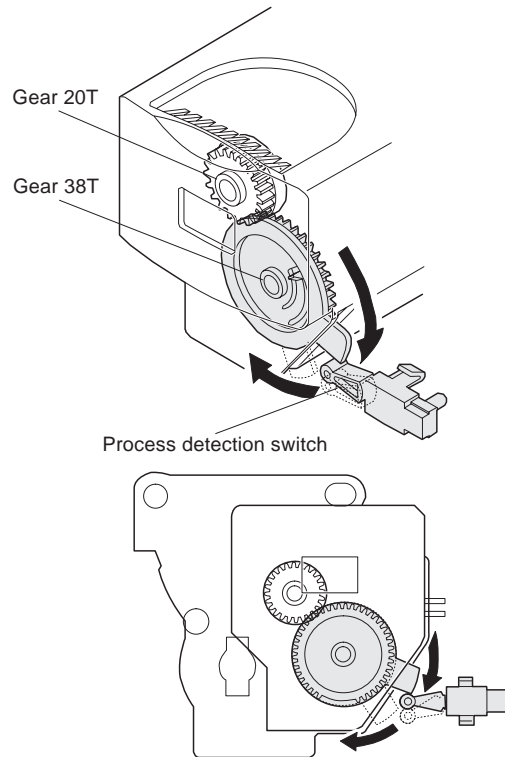


C. Conditions of occurrence of paper misfeed

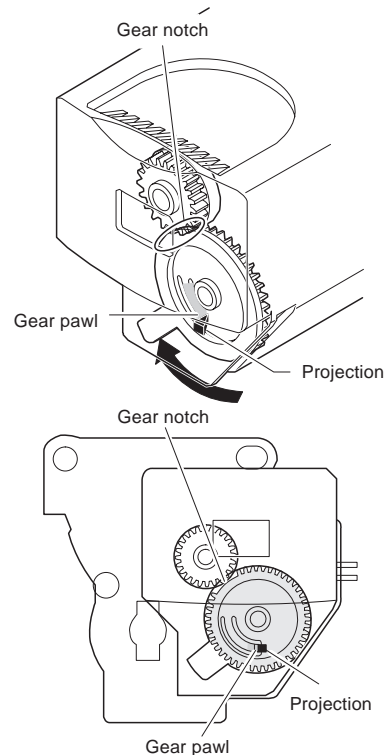
- (1) When the power is turned on:
 - PPD or POD is ON when the power is turned on.
- (2) Copy operation
 - a. PPD1 jam
 - 1) PPD1 does not turn off within 4 sec after turning on the resist roller.
 - b. PPD2 jam
 - 1) PPD2 is off immediately after turning on the resist roller.
 - 2) PPD2 does not turn off within 1.2 sec after turning off the resist roller.
 - c. POD jam
 - 1) POD does not turn on within 2.9 sec after turning on the resist roller.
 - 2) POD does not turn off within 1.5 sec ~ 2.7 sec after turning off PPD2.

Process unit new drum detection mechanism

1. When the power is turned on, the detection gear 38T is rotated in the arrow direction by the detection gear 20T to push the microswitch (process detection switch) installed to the machine sensor cover, making a judgement as a new drum.



2. When the detection gear 38Y turns one rotation, there is no gear any more and it stops. The latch section of the 38T gear is latched and fixed with the projection of the process cover.



[8] DISASSEMBLY AND ASSEMBLY

Before disassembly, be sure to disconnect the power cord for safety.

The disassembly and assembly procedures are described for the following sections:

1. High voltage section
2. Operation panel section
3. Optical section
4. Fusing section
5. Tray paper feed/transport section
6. Manual paper feed section
7. Rear frame section
8. Power section

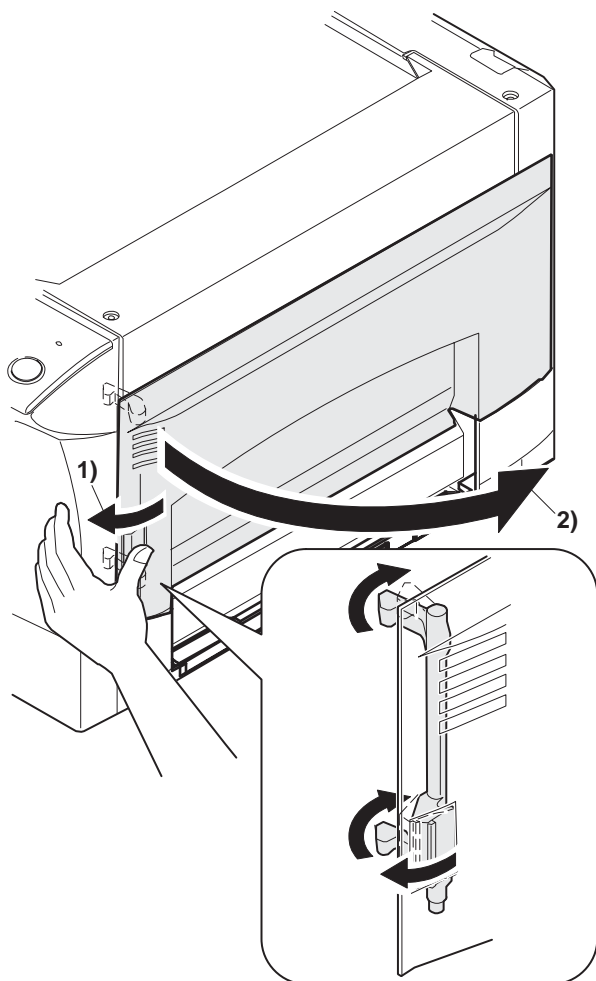
1. High voltage section

A. List

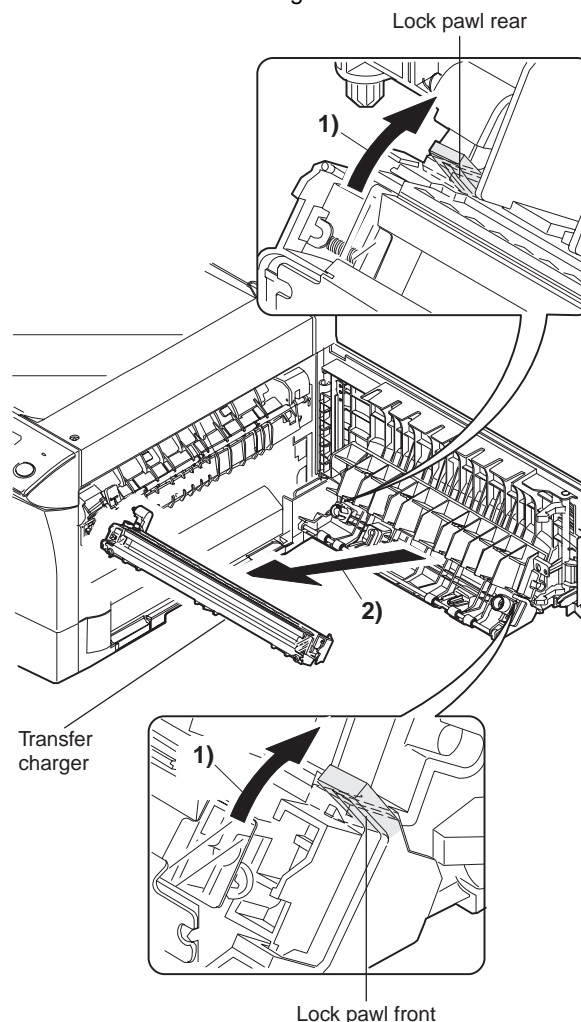
No.	Part name Ref.	page
1	Transfer charger unit	8-1
2	Charger wire	8-1

B. Disassembly procedure

- (1) Press the side cover open/close button and open the side cover.



- (2) Push up the lock pawls (2 positions) of the side cover, and remove the transfer charger.

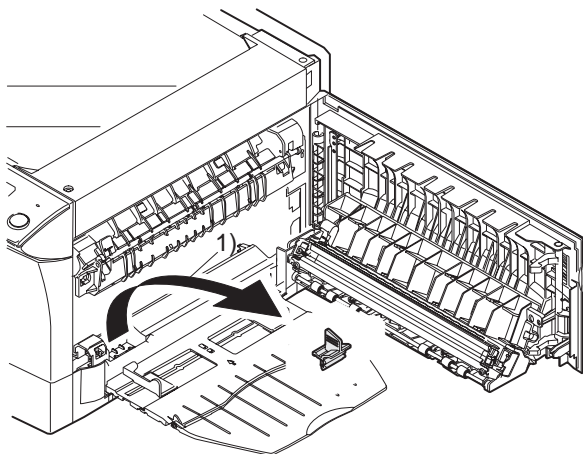


C. Assembly procedure

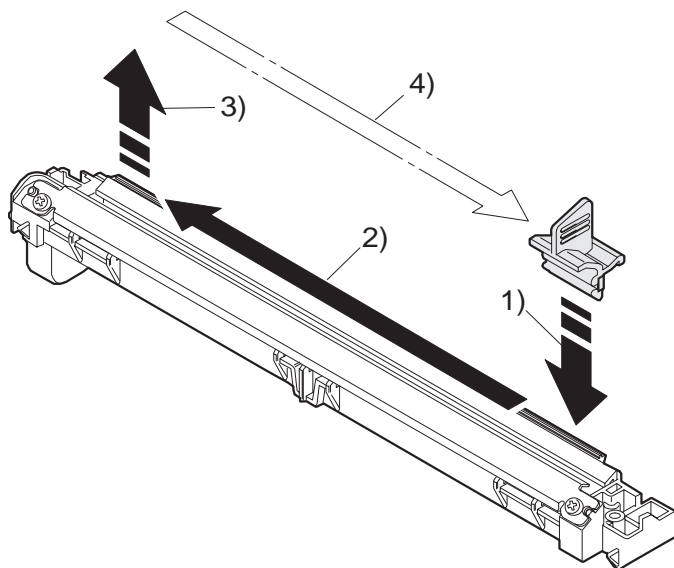
For assembly, reverse the disassembly procedure.

D. Charger wire cleaning

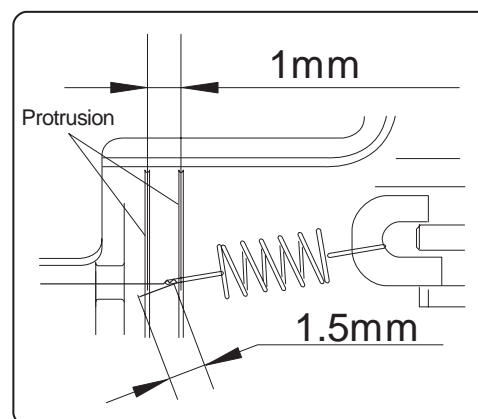
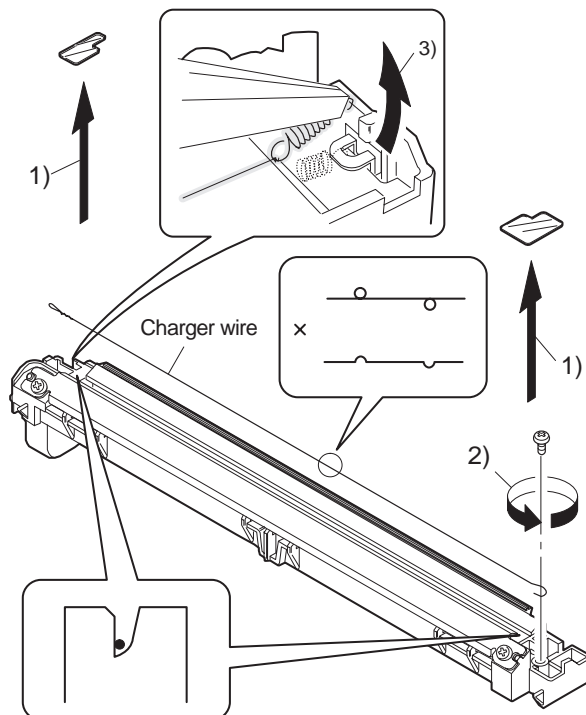
- (1) Remove the charger cleaner from the manual paper feed unit.



- (2) Set the charger cleaner to the transfer unit, and move it reciprocally a few times in the arrow direction shown in the figure below.

**E. Charger wire replacement**

- (1) Remove the TC cover and remove the screw.
- (2) Remove the spring and remove the charger wire.
- (3) Install a new charger wire by reversing the procedures (1) and (2). At that time, be careful of the following items.
 - The rest of the charger wire must be within 1.5mm.
 - The spring hook section (charger wire winding section) must be in the range of the projection section.
 - Be careful not to twist the charger wire.



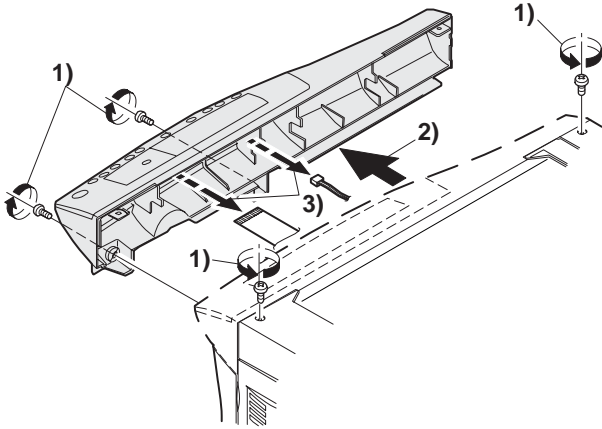
2. Operation panel section

A. List

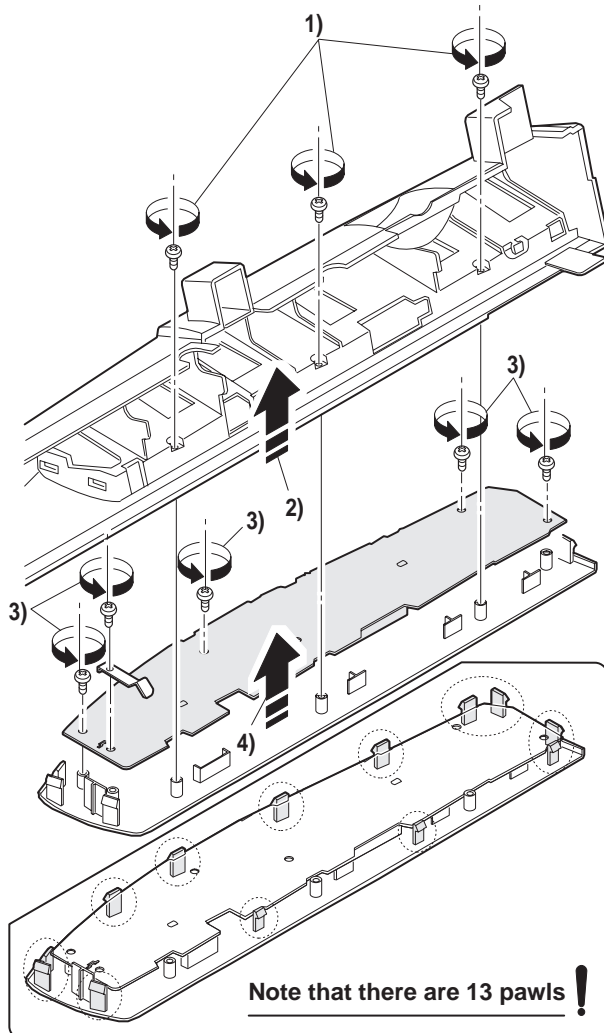
No.	Part name Ref.	page
1	Operation panel unit	8-3
2	Operation PWB	8-3

B. Disassembly procedure

- (1) Remove the screws (4 pcs.), the harness, and the operation panel unit.



- (2) Remove the screws (3 pcs.) and the PWB holder.
 (3) Remove the screws (3 pcs.) and the operation PWB.



C. Assembly procedure

For assembly, reverse the disassembly procedure

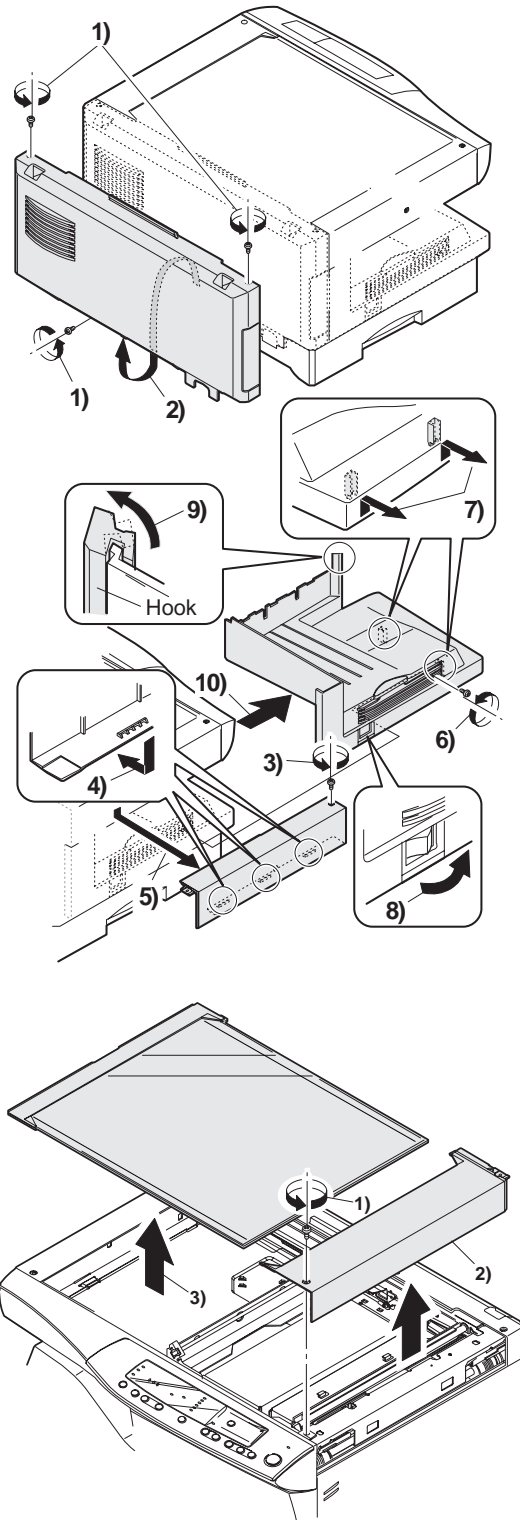
3. Optical section

A. List

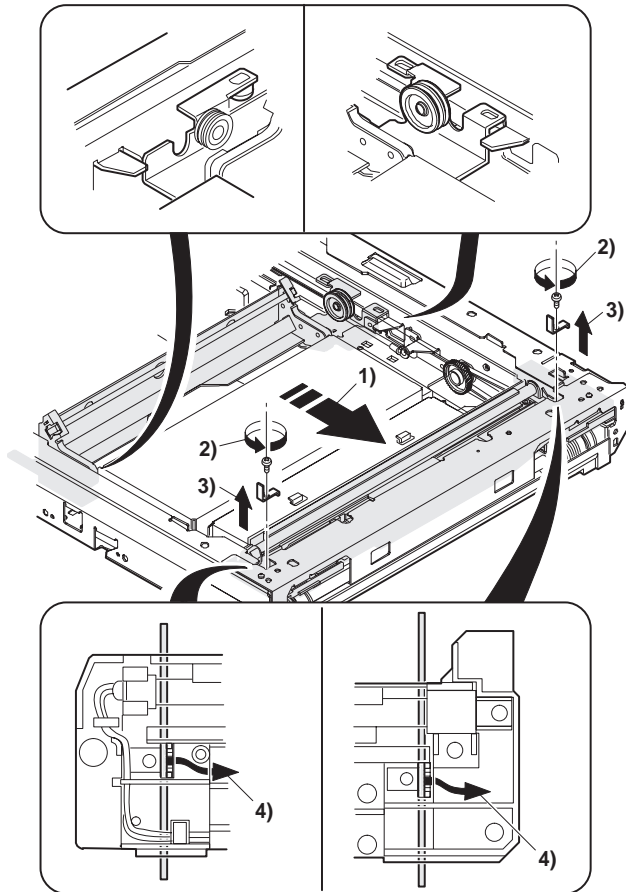
NO.	Part name Ref.	page
1	Copy lamp unit	8-4
2	Copy lamp	8-4
3	Lens unit	8-4

B. Disassembly procedure

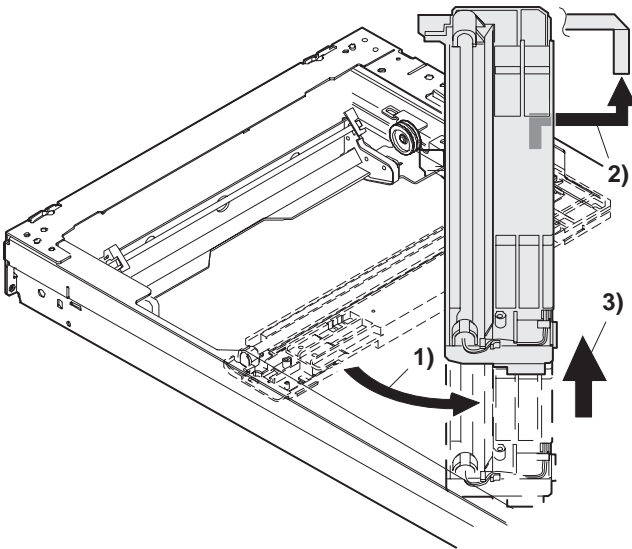
- (1) Remove the parts as shown below.



- (2) Remove the screws (2pcs.), and remove the copy lamp unit from the mirror base drive wire.

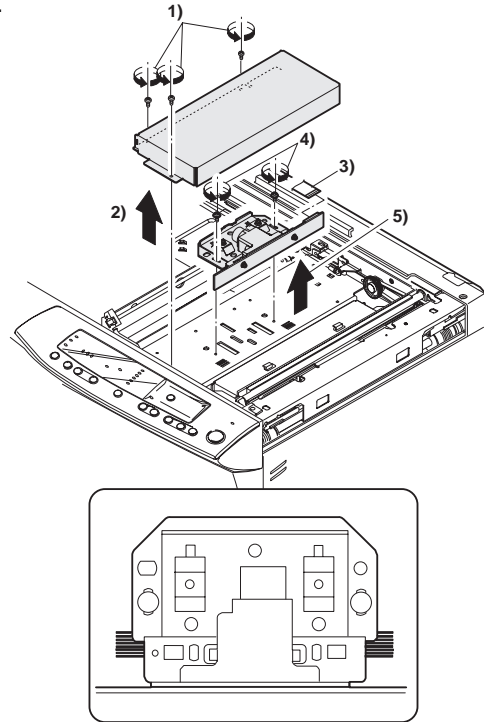


- (3) Pull the copy lamp unit toward you to remove the harness.



- (4) Remove the screw (4 pc) and remove the cover.

- (5) Remove the screws (2 pcs.), the harness, and the optical unit.



When installing the lens unit, refer to "9-7. Lens unit installation reference."

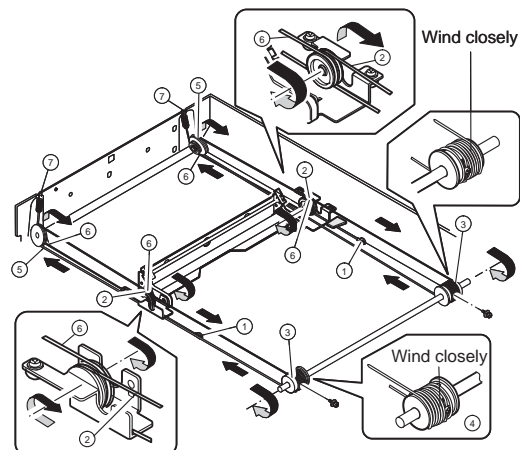
C. Assembly procedure

Basically reverse the disassembly procedure.

The mirror base drive wire and the lens drive wire stretching methods are described below.

a. Mirror base drive wire stretching

1. Hook the metal fixture of the mirror base drive wire on the projection of the optical base plate.
2. Pass the wire through the external groove of the double pulley. (At that time, check that No. 2/3 mirror unit is in contact with the mirror base positioning plate.)
3. Hold so that the winding pulley groove is up, and wind the mirror base drive wire 9 turns.
4. Put the 8th turn of the mirror base drive wire in the winding pulley groove and fix with a screw.
5. Pass the wire under Mo. 2/3 mirror unit plate and wind it around pulley A.
6. Pass the wire through the internal groove of the double pulley, and pass through pulley B.
7. Hook the spring hook on the optical base plate.



After installing the mirror base drive wire, be sure to perform main scanning direction image distortion adjustment.

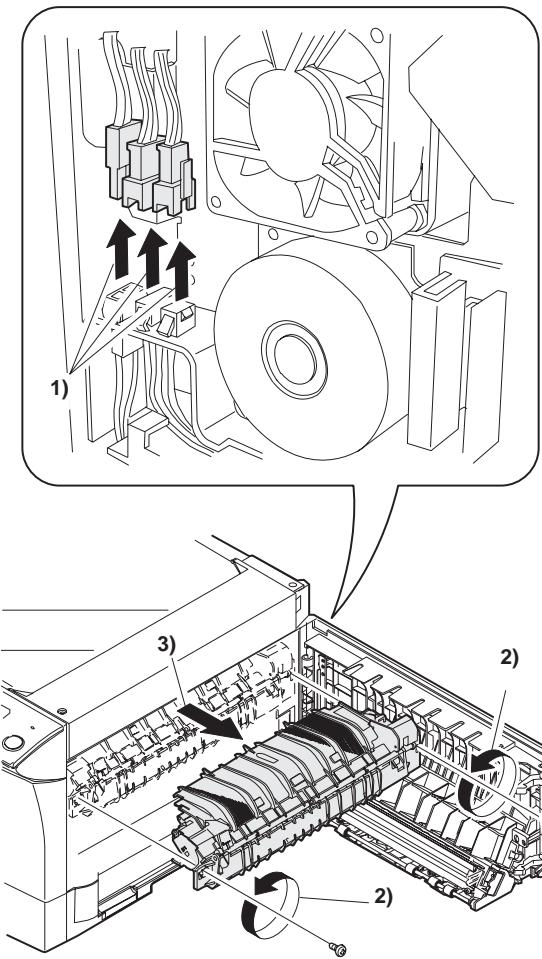
4. Fusing section

A. List

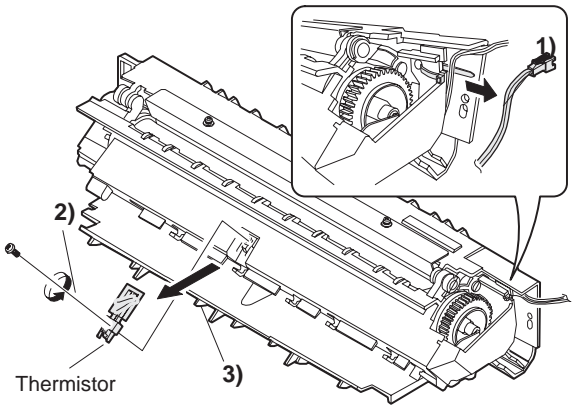
No.	Part name Ref.	page
1	Thermistor	8-5
2	PPD2 sensor	8-5
3	Heater lamp	8-6
4	Pressure roller	8-5
5	Heat roller	8-5

B. Disassembly procedure

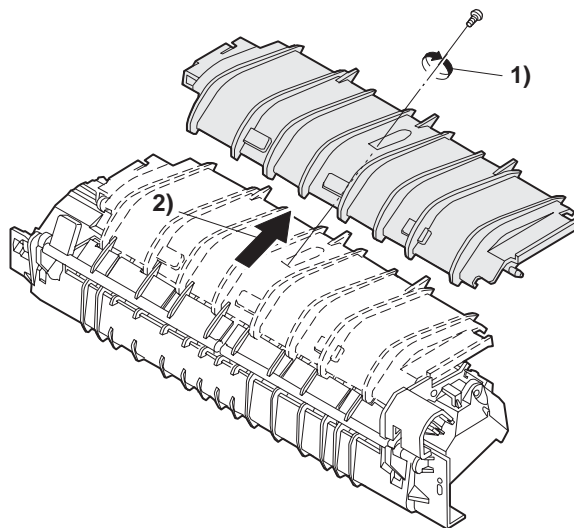
- (1) Remove the connectors (3 pcs.) of the rear cabinet.
- (2) Open the side cover, remove two screws, and remove the fusing unit.



- (3) Cut the binding band, remove the screw, and remove the thermistor.

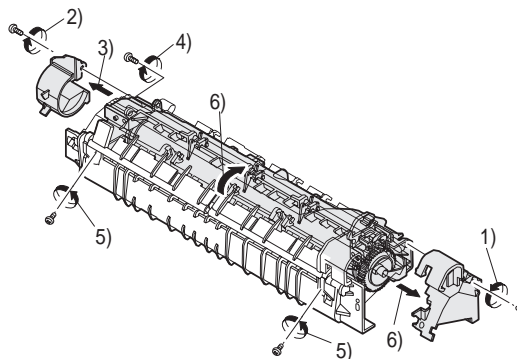


- (4) Remove the screw and remove the U-turn guide.

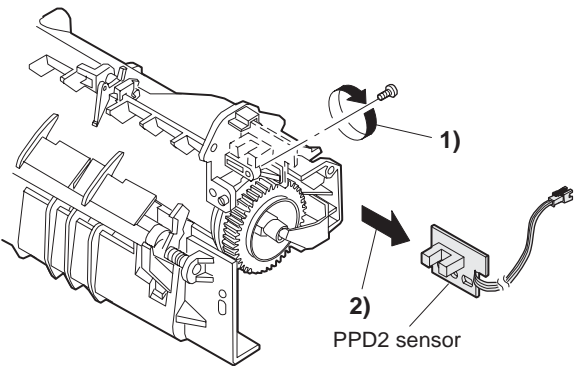


Pressure roller section disassembly

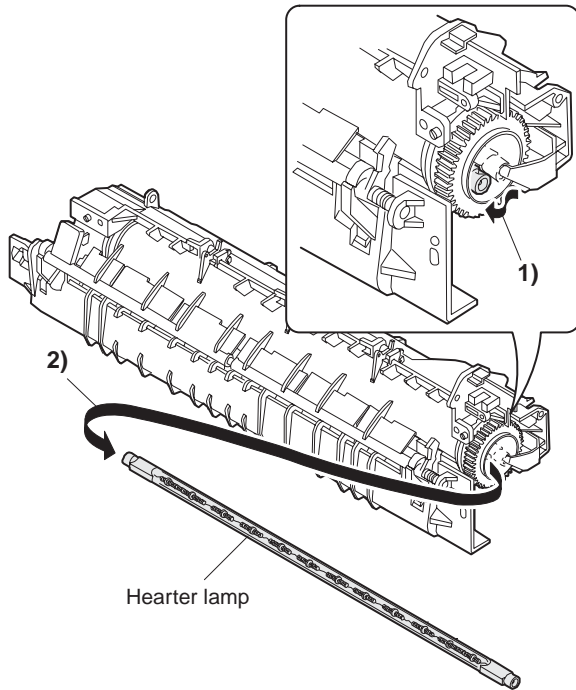
- (5) Remove the three screws, remove the fusing cover lower on the right side, and open the heat roller section.



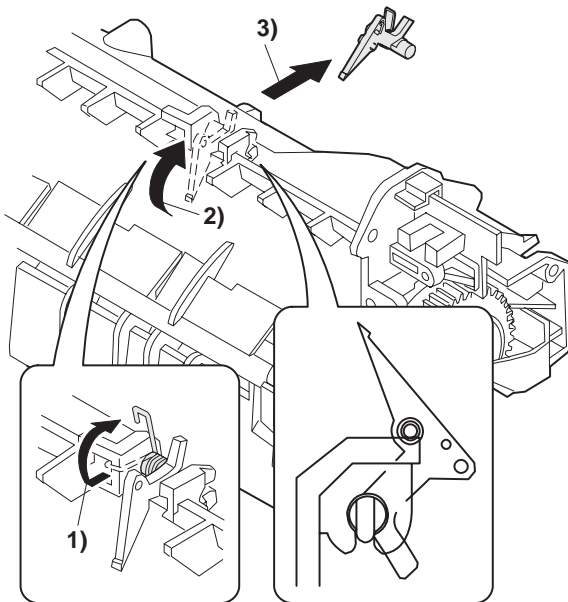
- (6) Remove the screw and remove the PPD2 sensor.



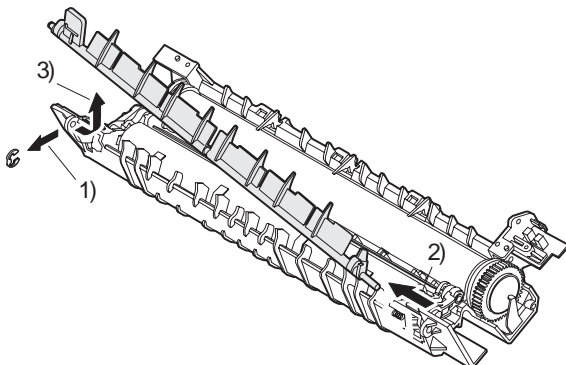
- (7) Remove the plate spring on the right and remove the heater lamp.



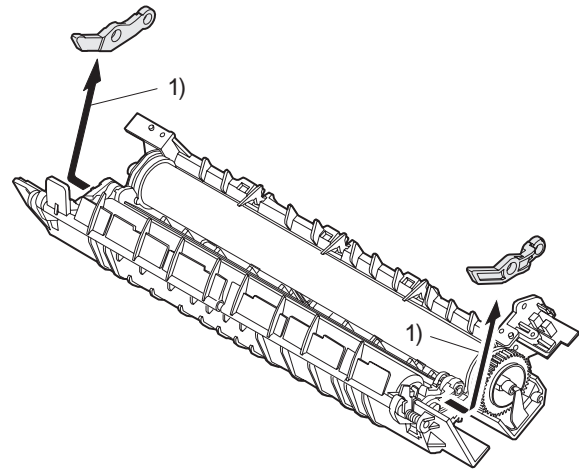
- (8) Remove the spring and remove the separation pawls (3 pcs.).



- (9) Remove the E-ring and remove the reverse gate.

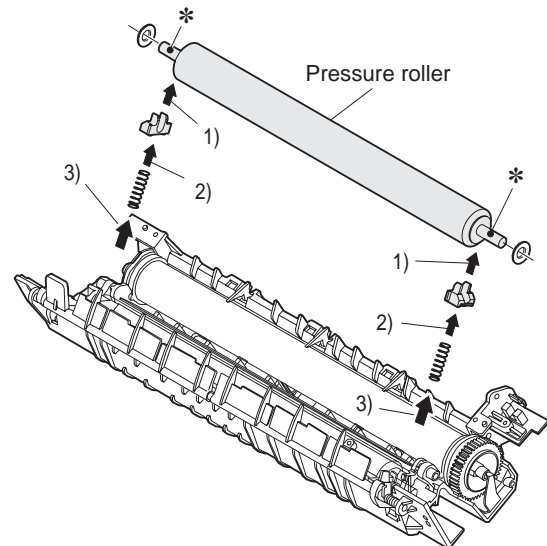


- (10) Remove the pressure release levers on the right and the left sides.



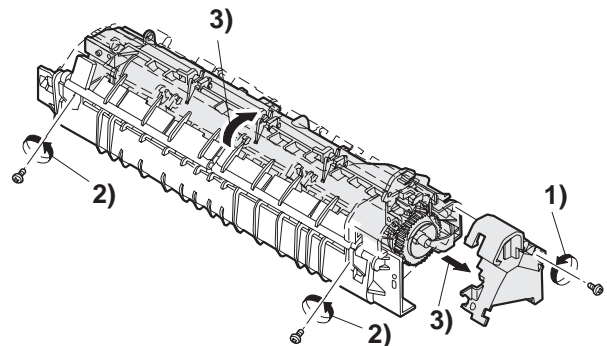
- (11) Remove the pressure roller, the pressure bearing, and the pring.

Note: Apply grease to the sections specified with *.

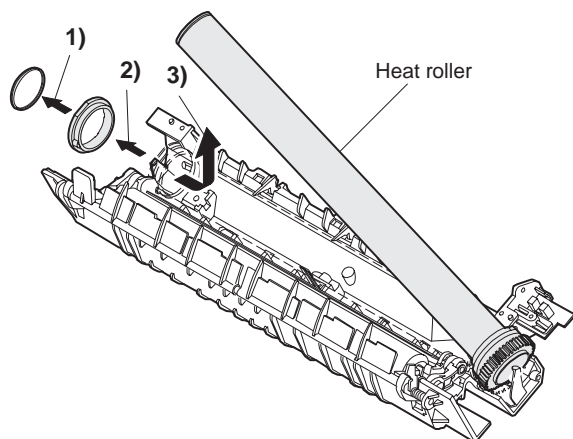


Heat roller disassembly (Continued from procedure (4).)

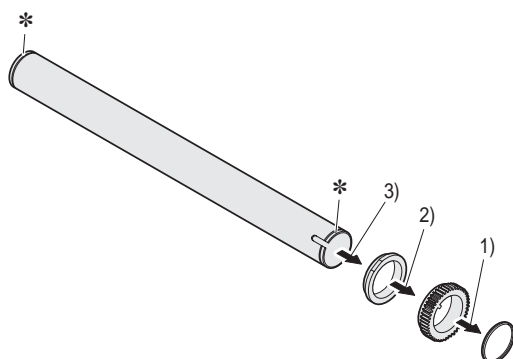
- (5) Remove screws, remove the fusing cover, and open the heat roller section.



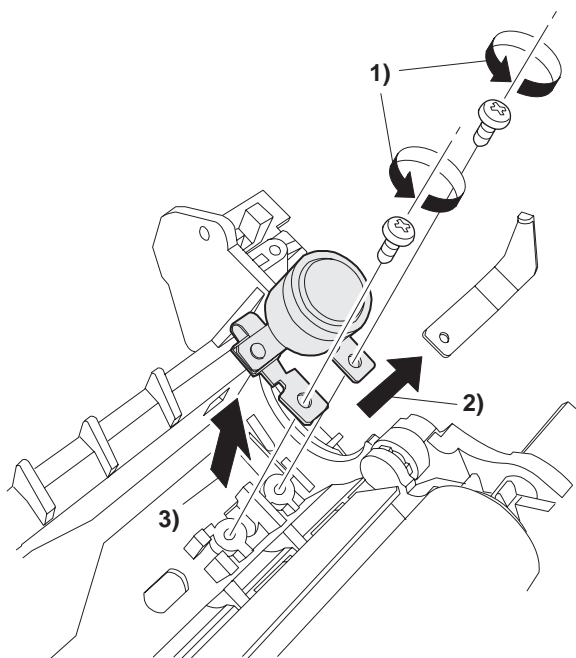
- (6) Remove the C-ring and the fusing bearing, and remove the heat roller.



- (7) Remove the parts from the heat roller.
Note: Apply grease to the sections specified with *.



- (8) Remove two screws and remove the thermo unit.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

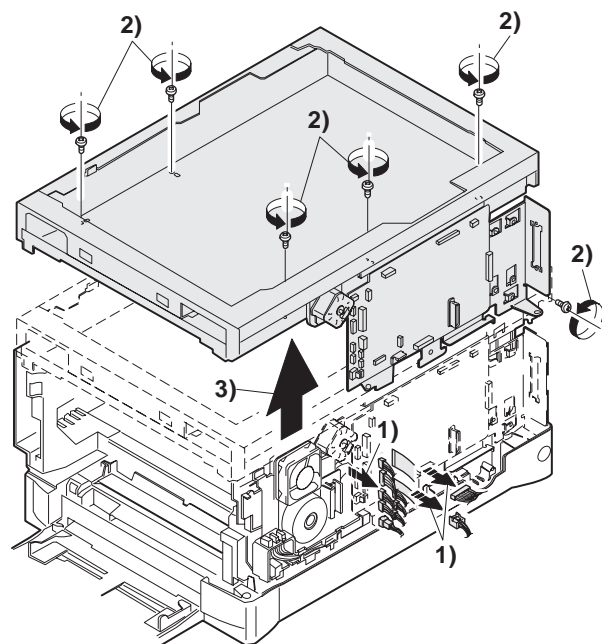
5. Tray paper feed/transport section

A. List

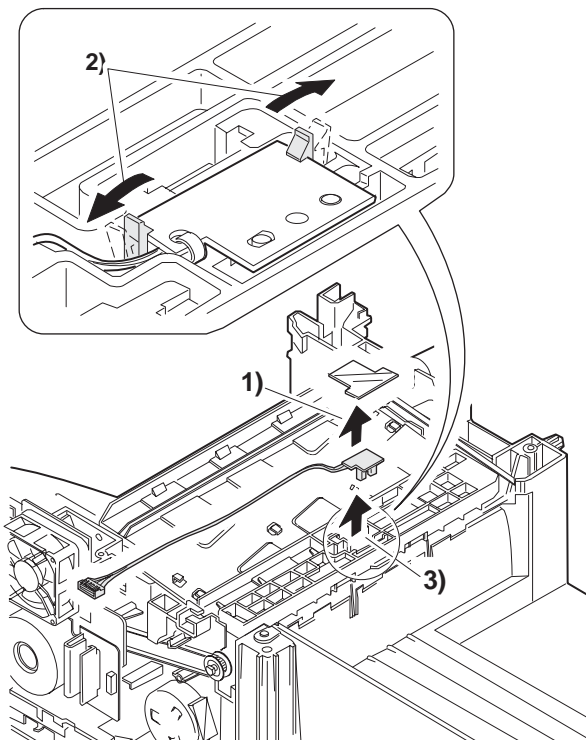
No.	Part name Ref.	page
1	PPD1 sensor PWB	8-11
2	LSU unit	8-10
3	Intermediate frame unit	8-10
4	Paper feed roller	8-11

B. Disassembly procedure

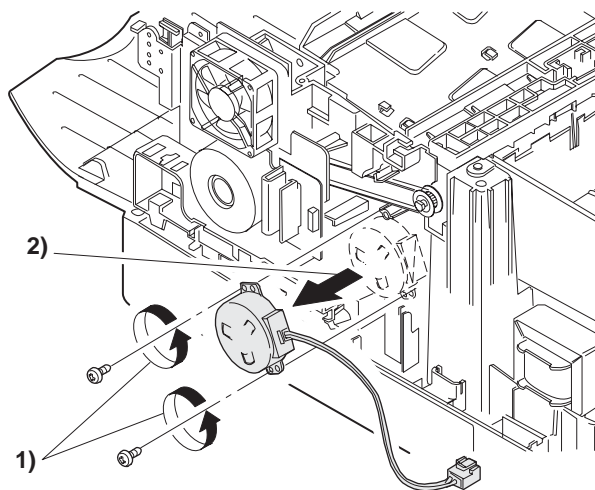
- (1) Remove six connectors and screws of the main PWB, and lift the optical unit and the main PWB to remove.



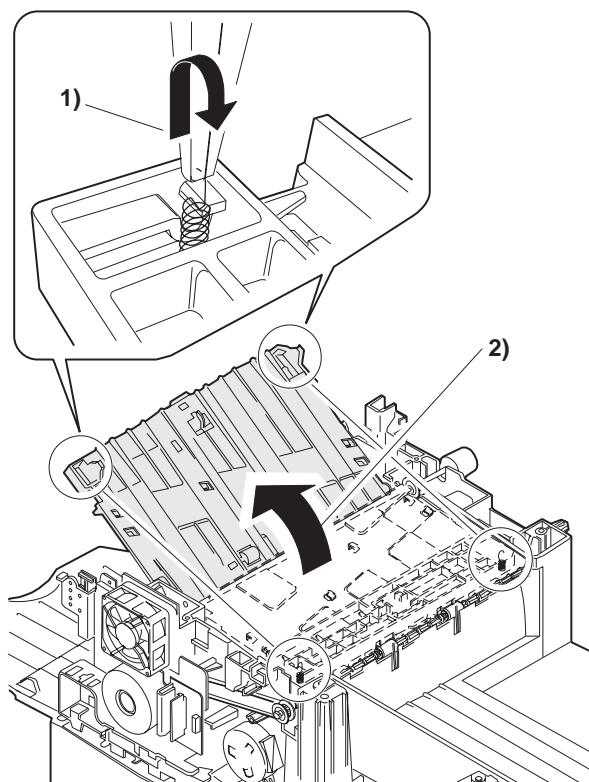
- (2) Remove the PWB insulation mylar and remove the paper transport detection sensor (PPD2).



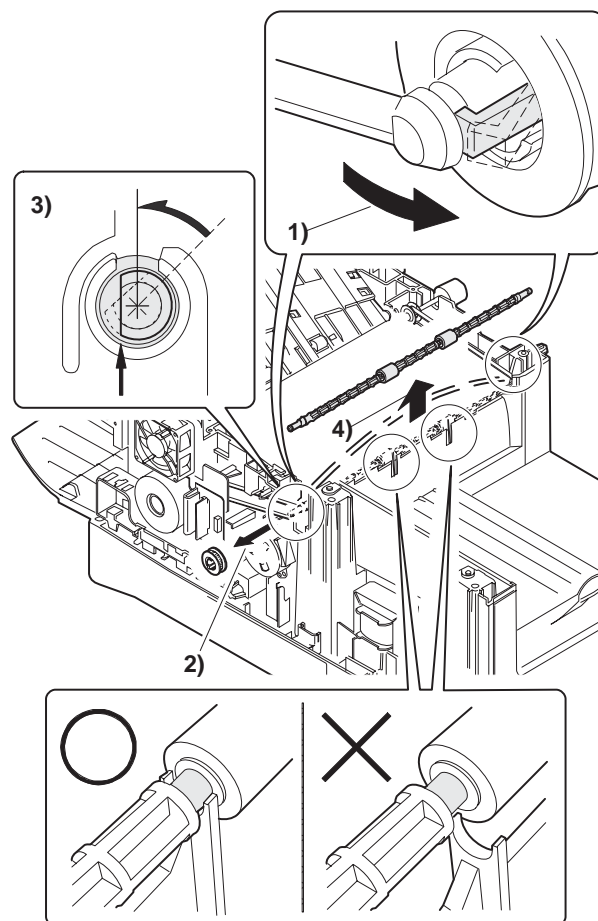
- (3) Remove two screws and remove the toner motor.



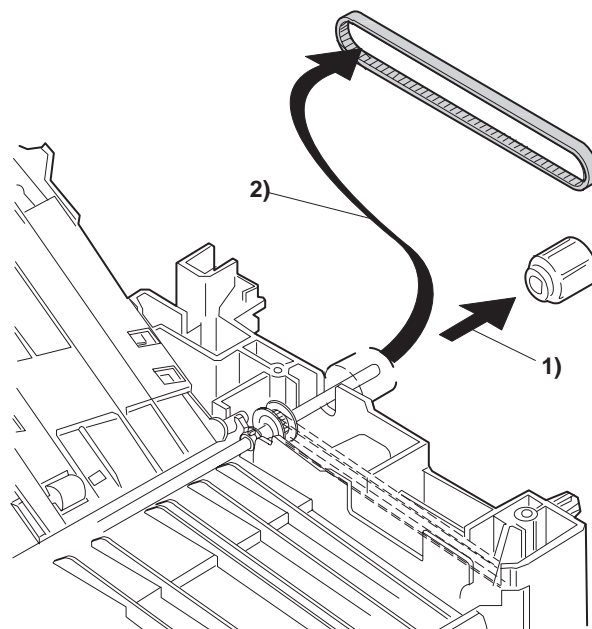
- (4) Remove two springs and open the intermediate frame unit.



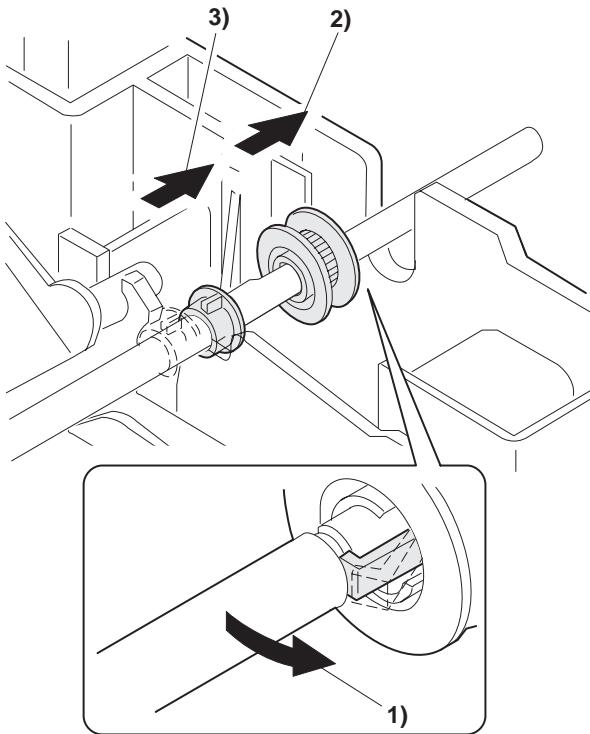
- (5) Remove the pulleys on the both sides and remove the paper exit roller.



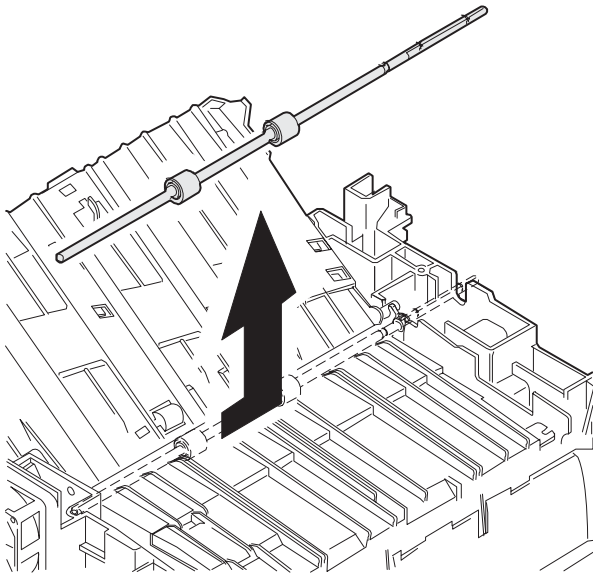
- (6) Pull out the paper exit roller knob and remove the belt.



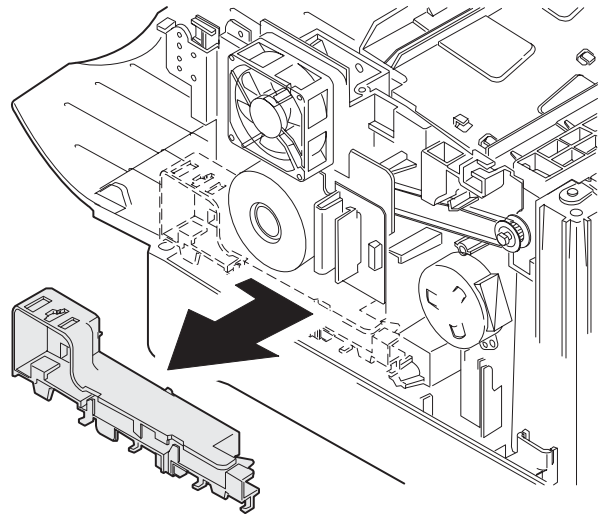
- (7) Release the belt pulley (a) lock and remove the belt pulley bearing.



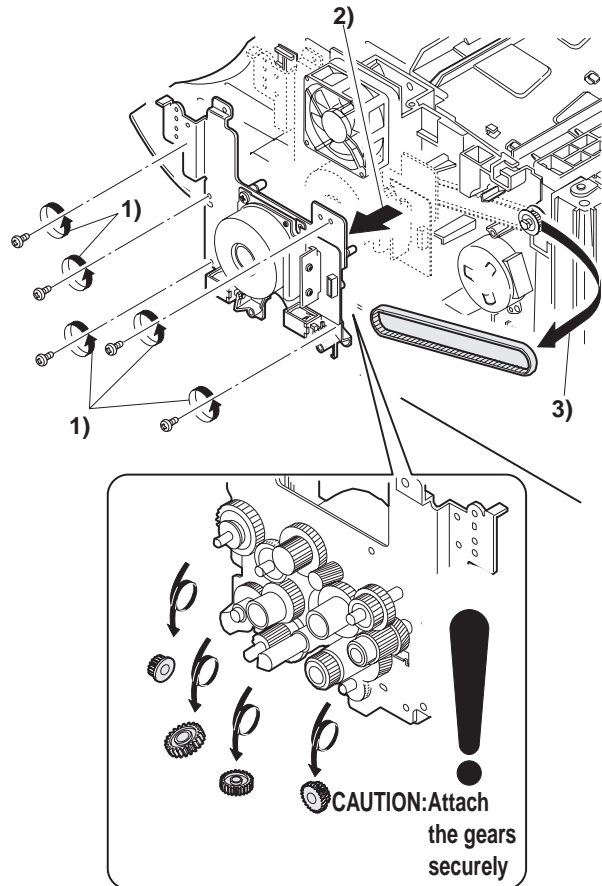
- (8) Remove the paper exit roller.



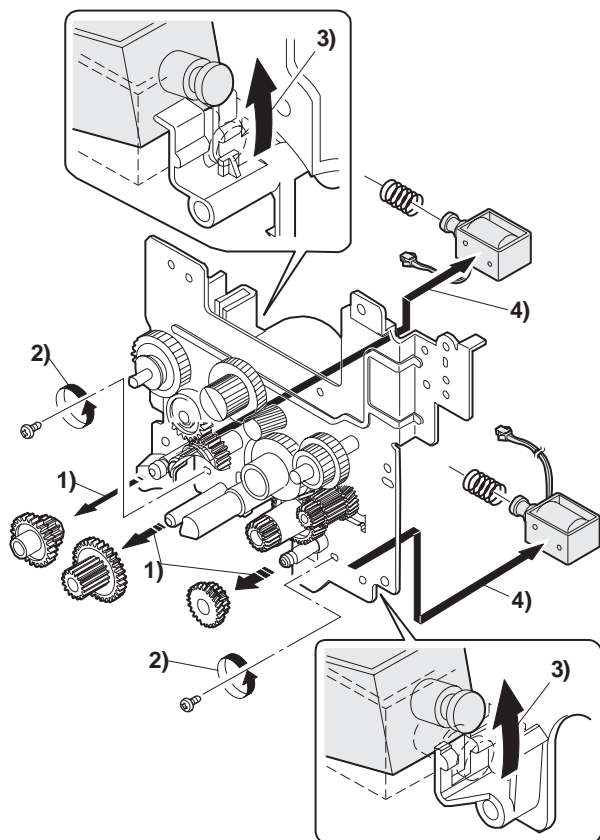
- (9) Remove the harness guide.



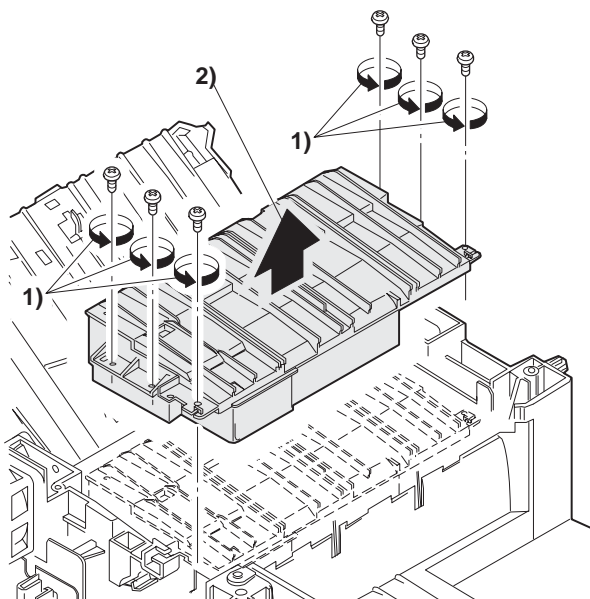
- (10) Remove five screws and remove the main drive plate and the belt.



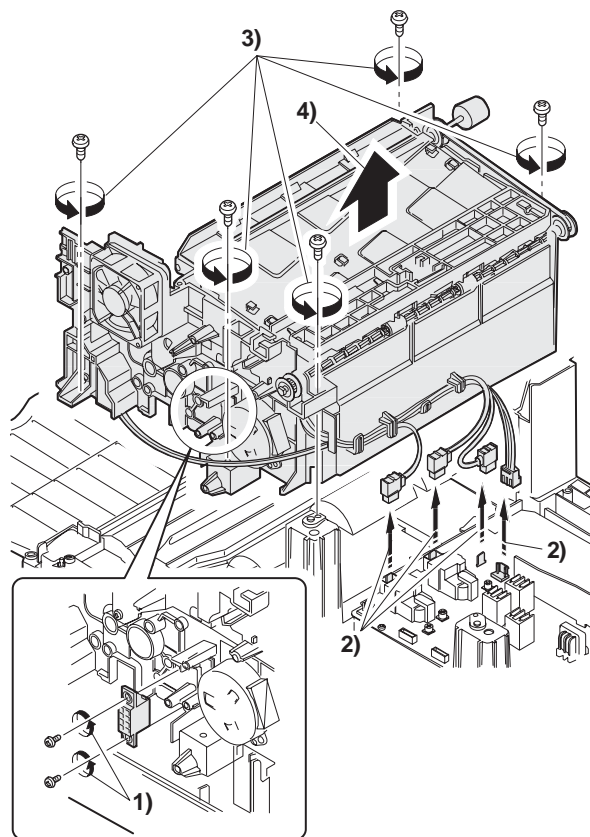
- (11) Remove the parts as shown below, and remove the pressure release solenoid and the paper feed solenoid.



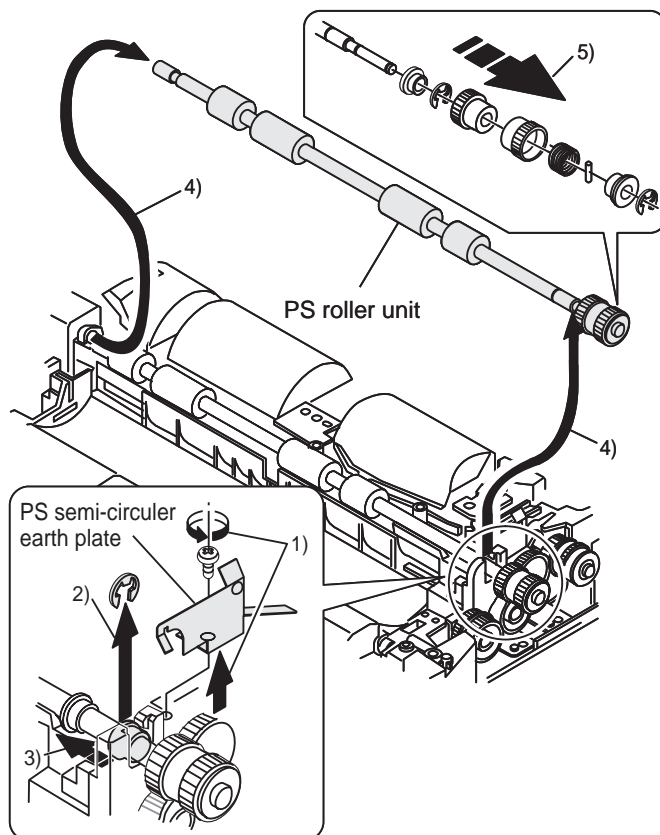
- (12) Remove six screws and remove the LSU unit.



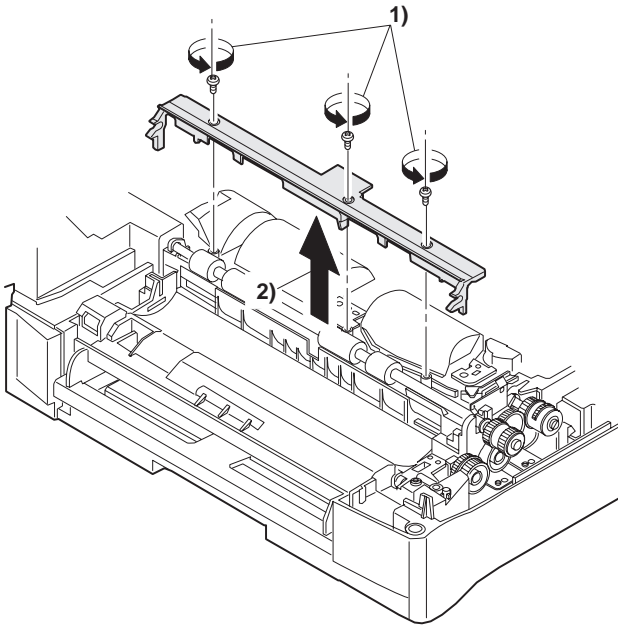
- (13) Remove two screws and remove the fusing connector.
(14) Remove five screws and the connector, and lift the intermediate frame unit to remove.



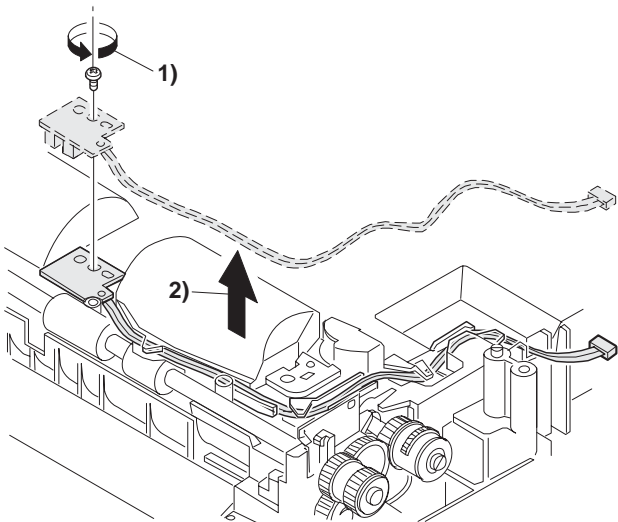
- (15) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.
(16) Remove the E-ring and remove the spring clutch from the PS roller unit.



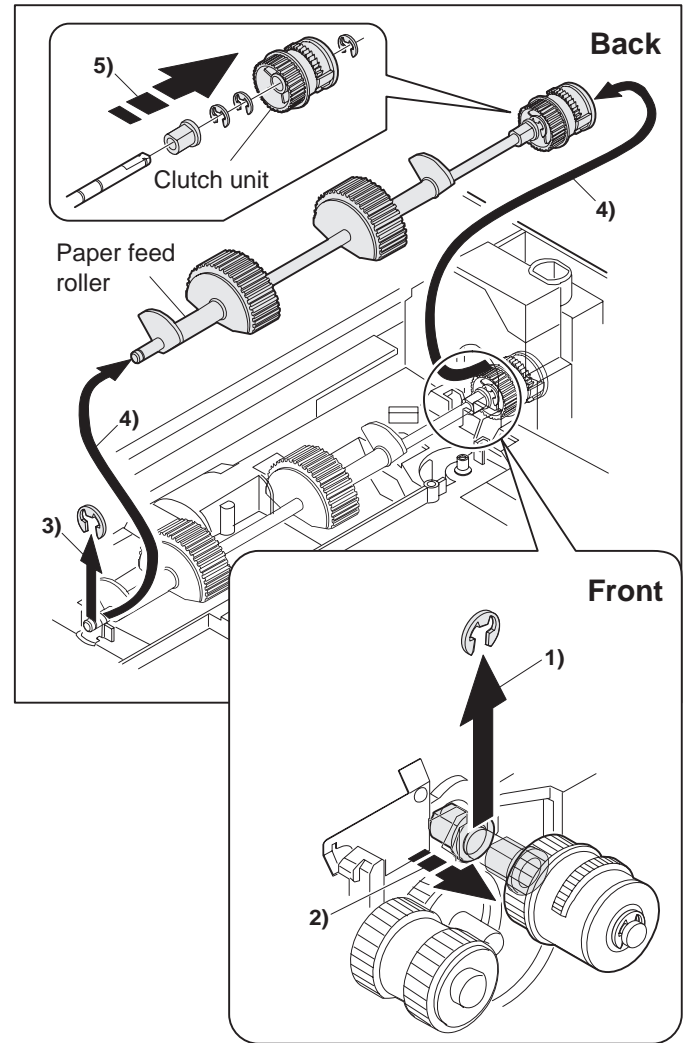
- (17) Remove three screws and remove the TC front paper guide.



- (18) Remove the screw and the connector, and remove the PPD1 sensor PWB.



- (19) Remove two E-rings and remove the paper feed roller.
(20) Remove three E-rings and remove the clutch unit.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

6. Manual paper feed section

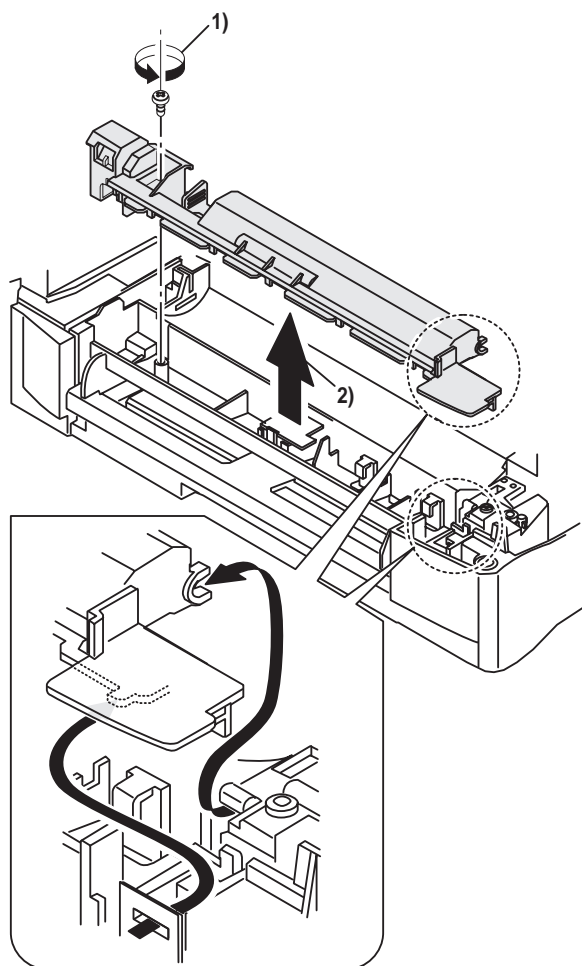
A. List

No.	Part name Ref.	page
1	Manual transport roller	8-15
2	Cassette detection switch	8-13
3	PPD1 sensor PWB	8-13
4	Side door detection unit	8-12

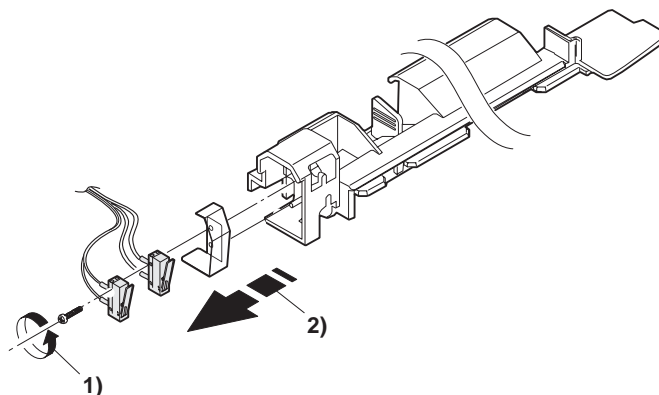
B. Disassembly procedure

Single unit

(1) Remove the screw and remove the single upper cover.

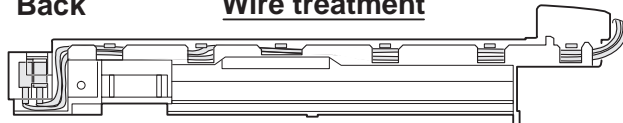


(2) Remove the screw and remove the side door detection unit.

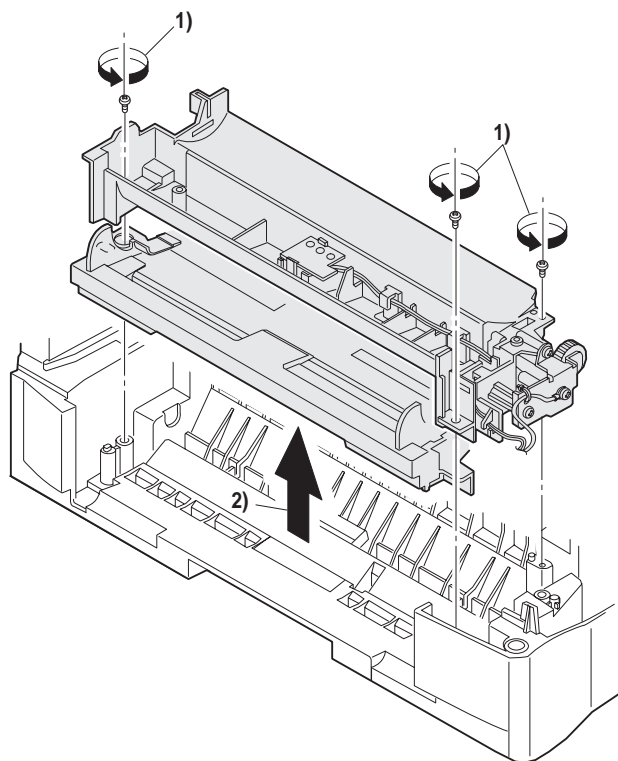


Back

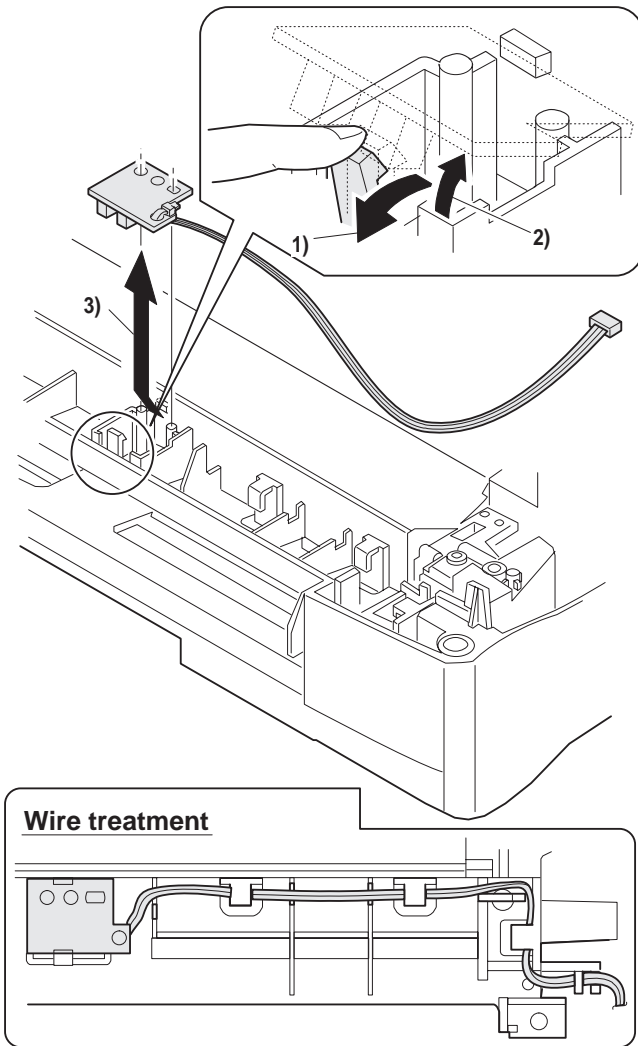
Wire treatment



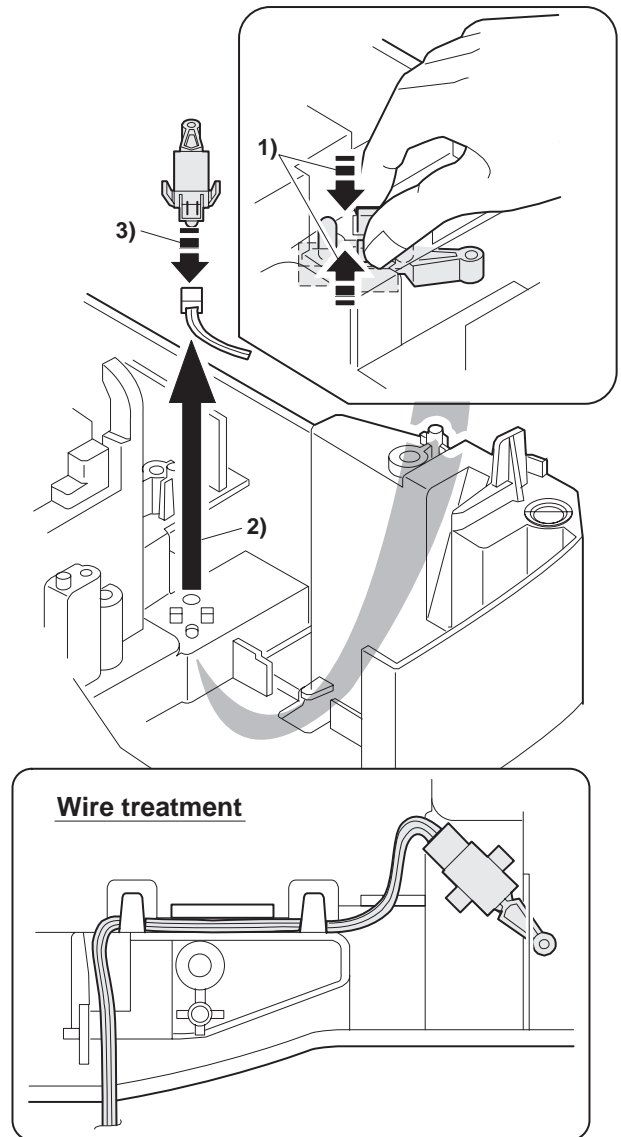
(3) Remove three screws and remove the single manual feed upper frame.



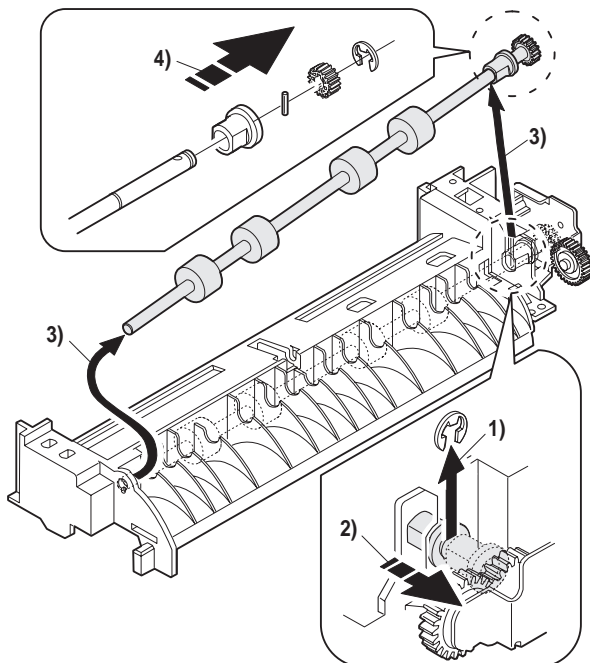
(4) Remove the PPD1 sensor PWB.



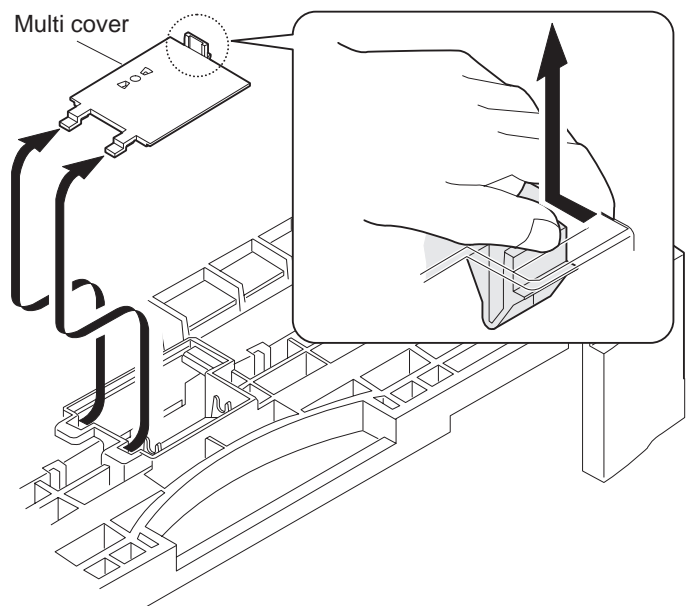
(6) Remove the cassette detection switch.



(5) Remove the E-ring and remove the manual paper feed transport roller.

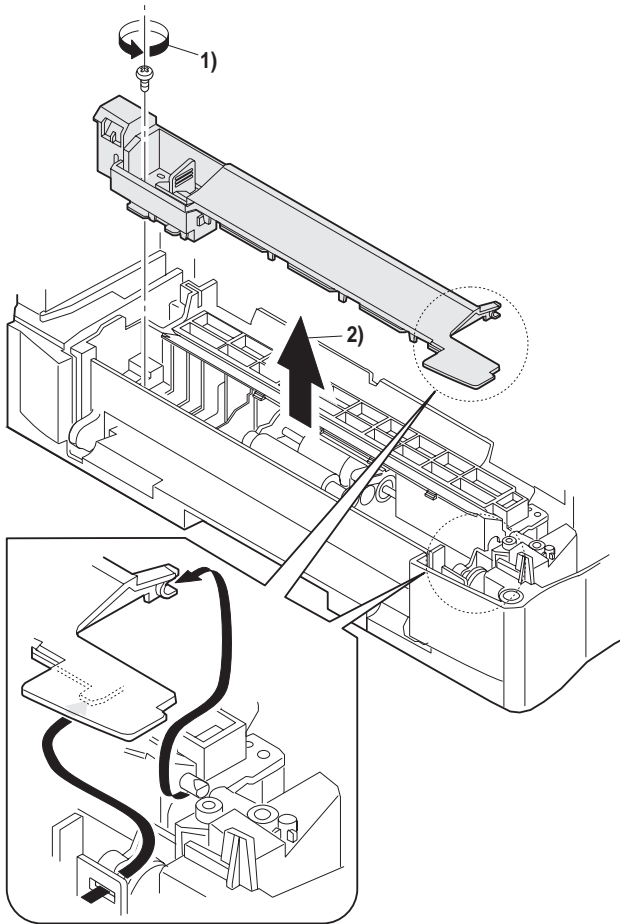


(7) Remove the multi cover.

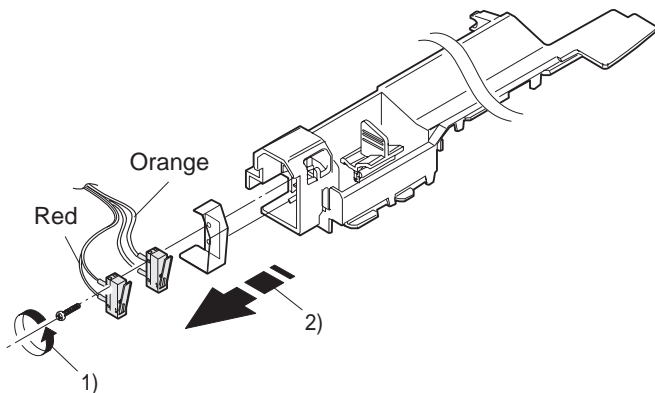
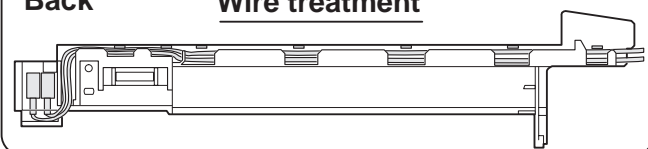


Multi unit

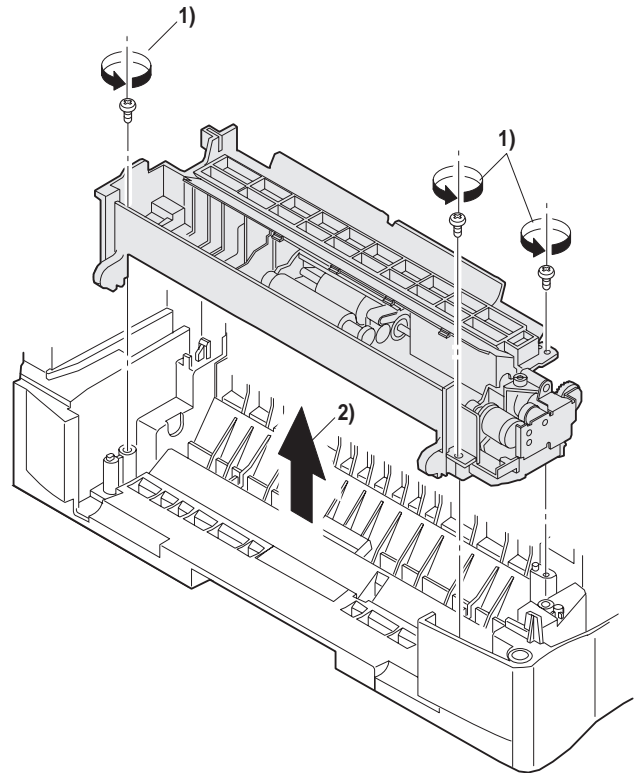
- (1) Remove the screw and remove the multi upper cover.



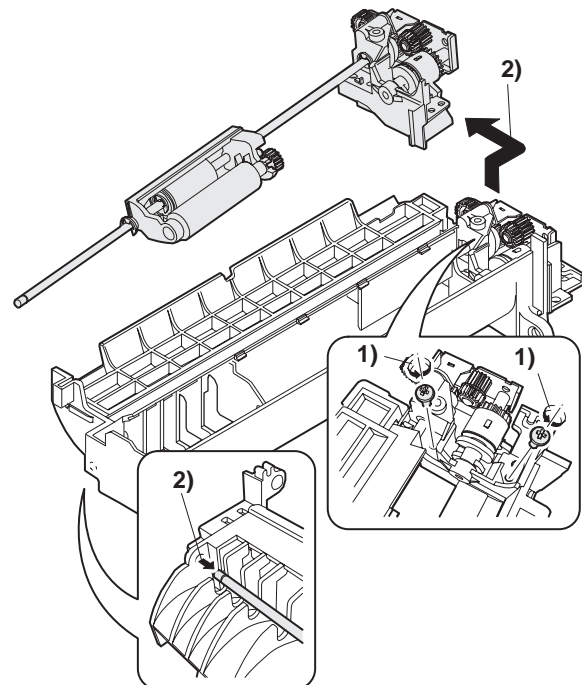
- (2) Remove the screw and remove the side door detection unit.

**Back****Wire treatment**

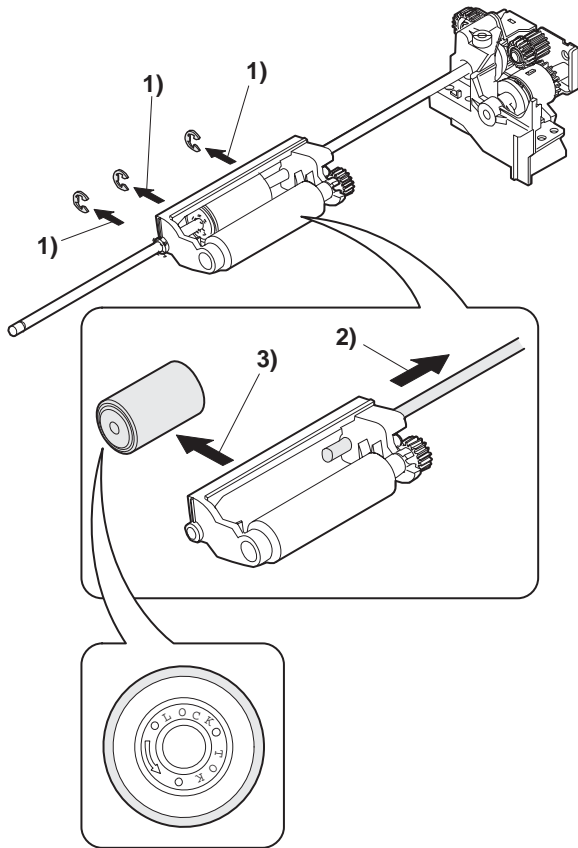
- (3) Remove three screws and remove the multi paper feed upper frame.



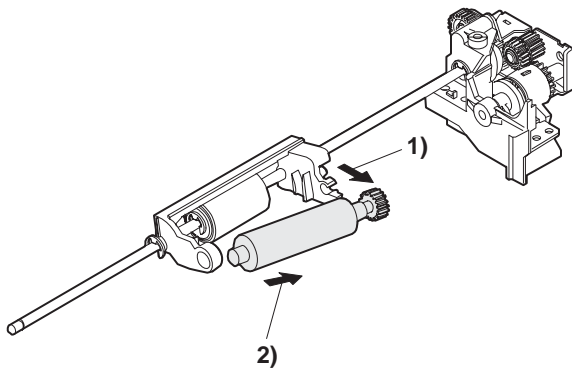
- (4) Remove two screws and remove the multi feed bracket unit from the multi paper feed upper frame.



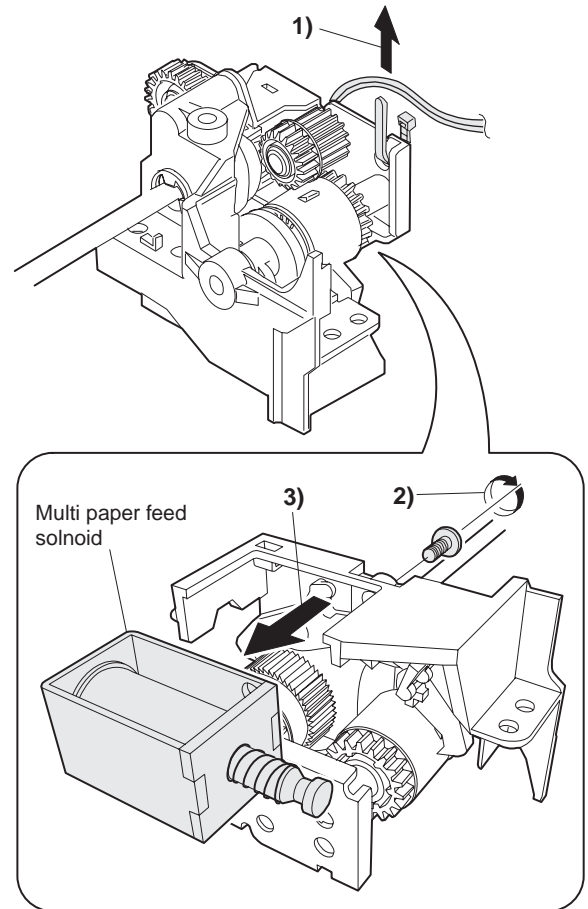
- (5) Remove three E-rings and remove the manual paper feed roller B9.



- (6) Remove the pick-up roller.



- (7) Cut the binding band and remove the multi paper feed solenoid.

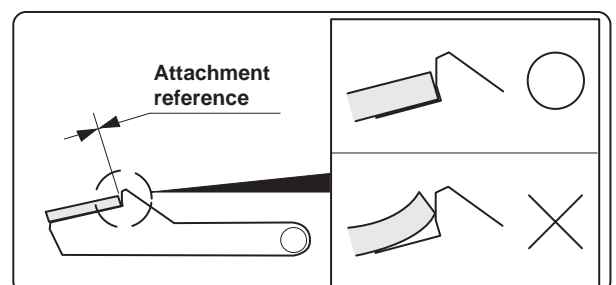
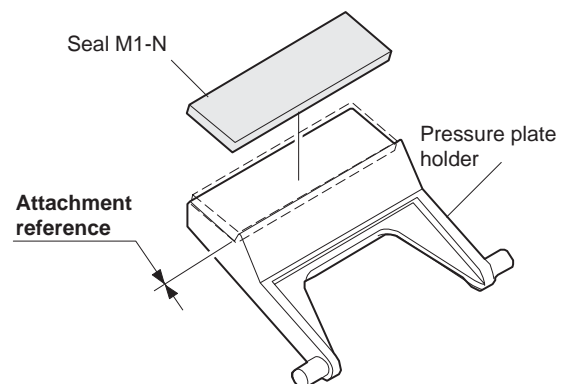


C. Assembly procedure

For assembly, reverse the disassembly procedure.

D. Pressure plate holder attachment

- (1) Attach the pressure plate holder so that the resin section is not covered with the seal M1-N.



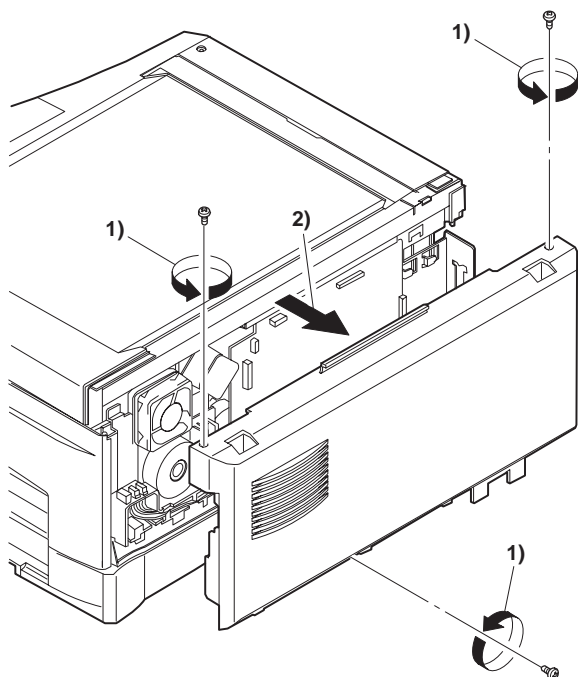
7. Rear frame section

A. List

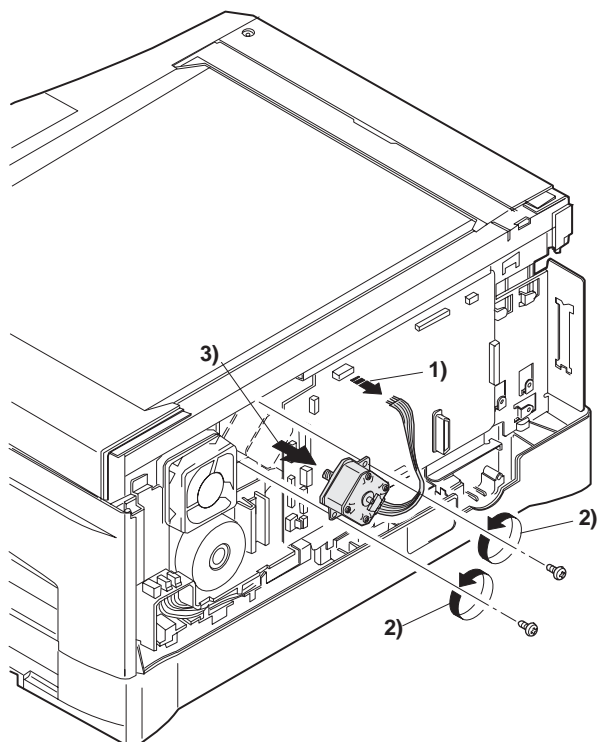
No.	Part name Ref.	page
1	Mirror motor	8-16
2	Main motor	8-16
3	Exhaust fan motor	8-16

B. Disassembly procedure

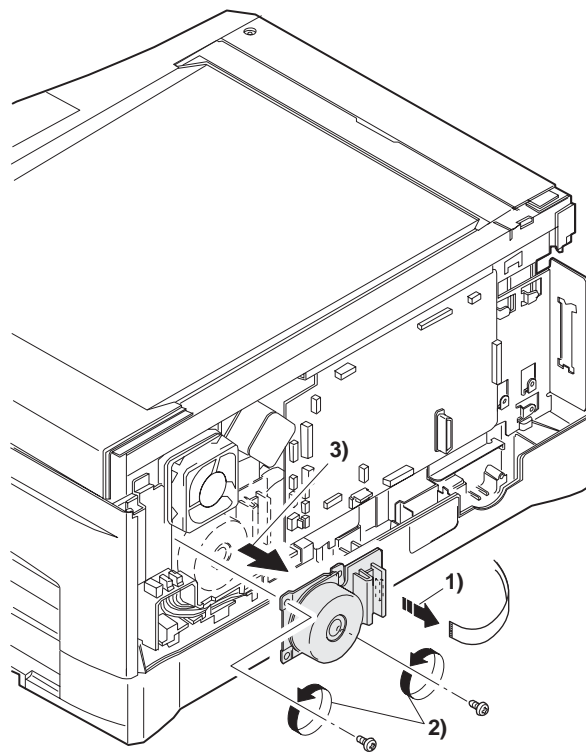
(1) Remove three screws and remove the rear cabinet.



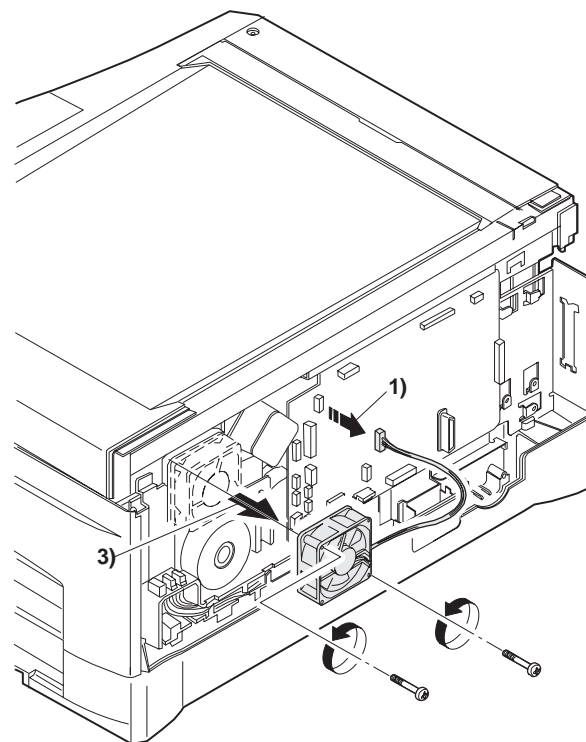
(2) Remove two screws, the harness, and the mirror motor.



(3) Remove two screws and one harness, and remove the main motor.



(4) Remove two screws and one connector, and remove the exhaust fan motor.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

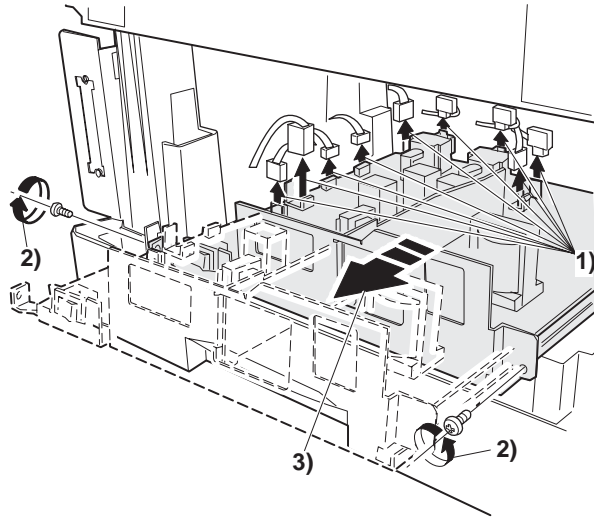
8. Power section

A. List

No.	Part name Ref.	page
1	Power PWB	8-17

B. Disassembly procedure

- (1) Remove two screws and one connector, and remove the power PWB.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

[9] Adjustment

1. Optical section

(1) Image distortion adjustment

There are following two types of image distortion.

- Horizontal image distortion
- Vertical image distortion

In this machine, the image distortion is adjusted by changing the parallelism of mirrors (copy lamp unit, No. 2/3 mirror unit).

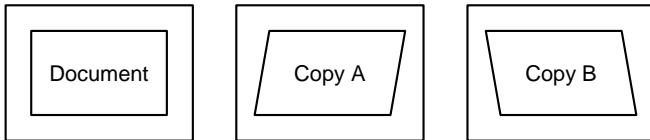
a. Horizontal image distortion adjustment

I. Summary

Parallelism of mirrors can be made by installing the copy lamp unit and No. 2/3 mirror unit to the reference position. However, it must be checked by making a copy, and must be adjusted if necessary.

II. Cases when the adjustment is required

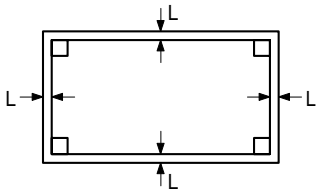
- 1) When the copy lamp unit and No.2/3 mirror unit are disassembled or their part is replaced.
- 2) When the copy lamp unit and No.2/3 mirror unit drive section is disassembled or its part is replaced.
- 3) When the copy image is distorted as shown below:



III. Necessary tools

- Screwdriver (+)
- Hex wrench
- Scale
- Test chart for distortion adjustment (Make a chart shown below by yourself.)

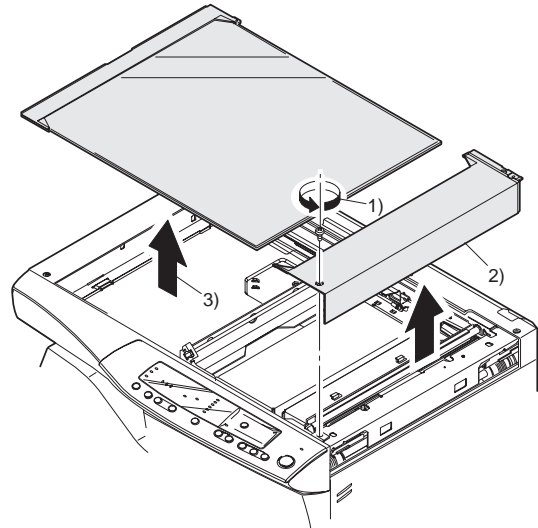
Draw a rectangle on a paper (B4 or 8 1/2" × 14") as shown below.
Be sure to make four right angles.



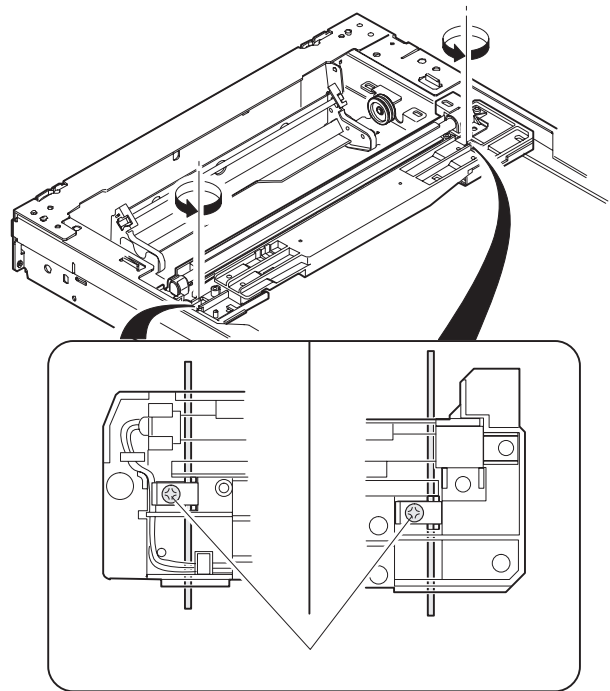
L = 10mm

IV. Adjustment procedure

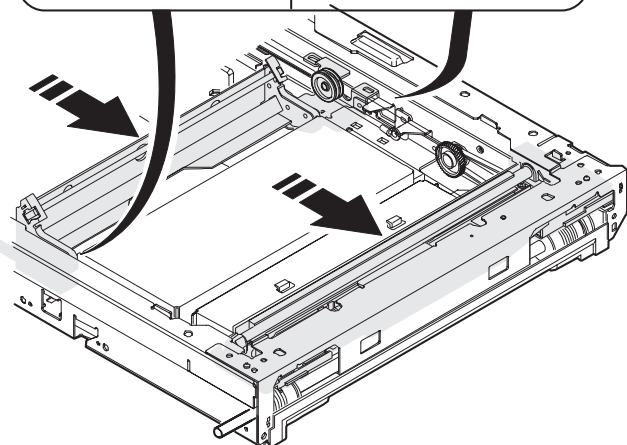
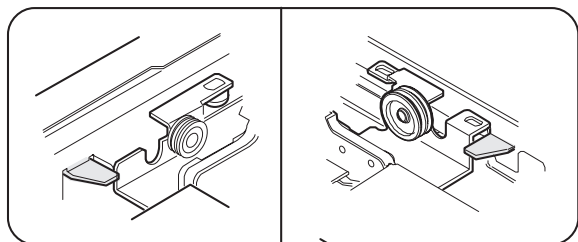
- 1) Remove the right cabinet (manual paper feed unit), the document reference plate.
- 2) Remove the document glass.



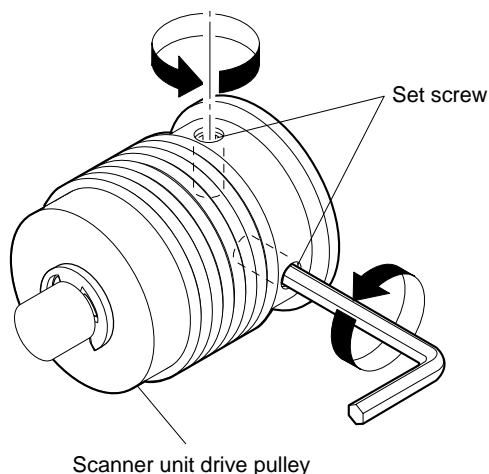
- 3) Loosen the fixing screw of the copy lamp unit wire.



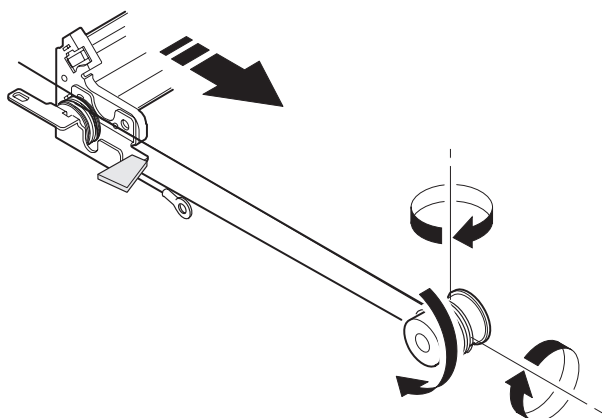
- 4) Manually turn the copy lamp unit/No.2/3 mirror unit drive gear to bring No.2/3 mirror unit into contact with No.2/3 mirror unit positioning plate. When No.2/3 mirror unit makes contact with No.2/3 mirror unit positioning plate in the rear frame side simultaneously, the mechanical parallelism of No.2/3 mirror unit is proper.
If one side of No.2/3 mirror unit makes contact with No.2/3 mirror unit positioning plate and the other side does not, the parallelism is improper.
If the parallelism is improper, perform the procedure of step 5).



- 5) Loosen the copy lamp unit/No.2/3 mirror unit drive pulley setscrew in the side where No.2/3 mirror unit does not make contact with No.2/3 mirror unit positioning plate.



- 6) Without moving the copy lamp unit/No.2/3 mirror unit drive pulley shaft, manually turn the copy lamp unit/No.2/3 mirror unit drive pulley in the same direction of the loosened setscrew. When it makes contact with No.2/3 mirror unit positioning plate, tighten and fix the setscrew.

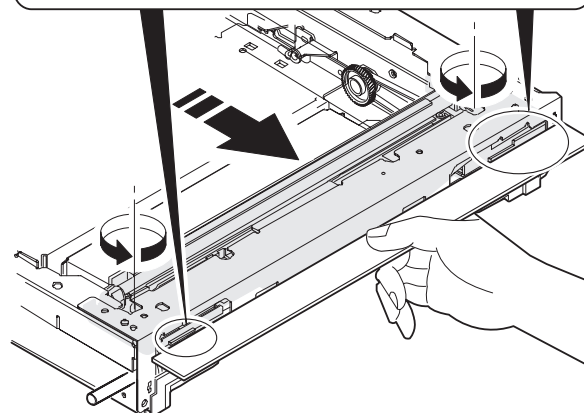
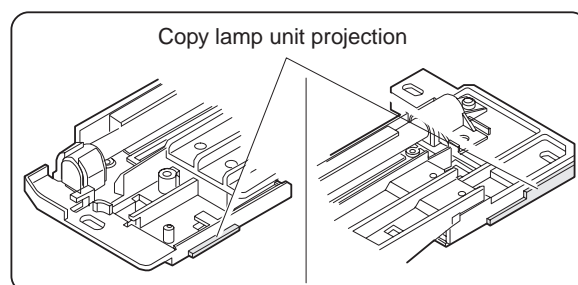


- 7) Manually turn the copy lamp unit/No.2/3 mirror unit drive gear to bring No.2/3 mirror unit into contact with the positioning plate, and perform the procedure of step 4). Repeat procedures of steps 4) to 7) until the parallelism of No.2/3 mirror unit is properly set.

- 8) With No.2/3 mirror unit positioning plate in contact with No.2/3 mirror unit, bring the copy lamp unit into contact with the right frame and fix the copy lamp unit to the drive wire.

Procedures 1) to 8) are for adjustment of mechanical horizontal parallelism. The copy lamp unit and No.2/3 mirror are fixed to the specified positions and the mechanical horizontal parallelism of No.2/3 mirror is adjusted.

Then the optical horizontal parallelism must be adjusted in the following procedures.



- 9) Set the image distortion check chart on the document table, and make a reduction copy (75%) on an A4 or 11" × 8 1/2" paper with the document cover open.

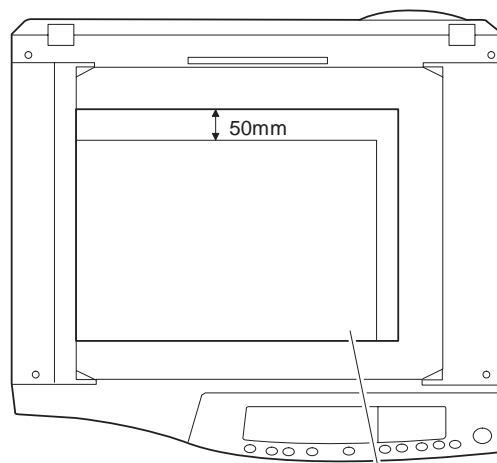
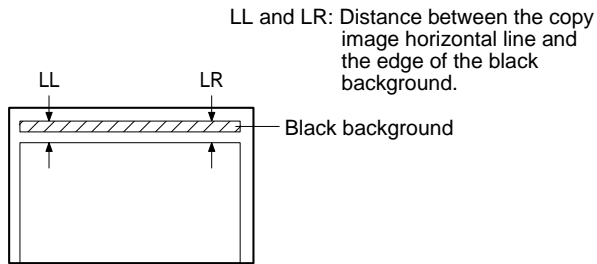
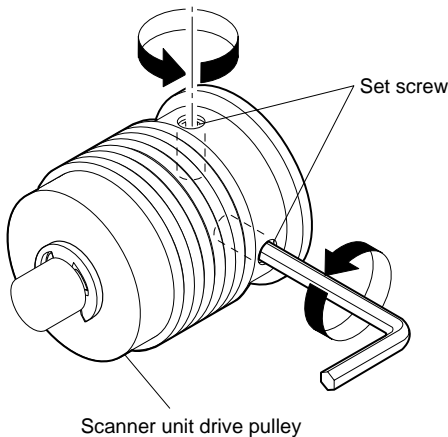


Image distortion check chart

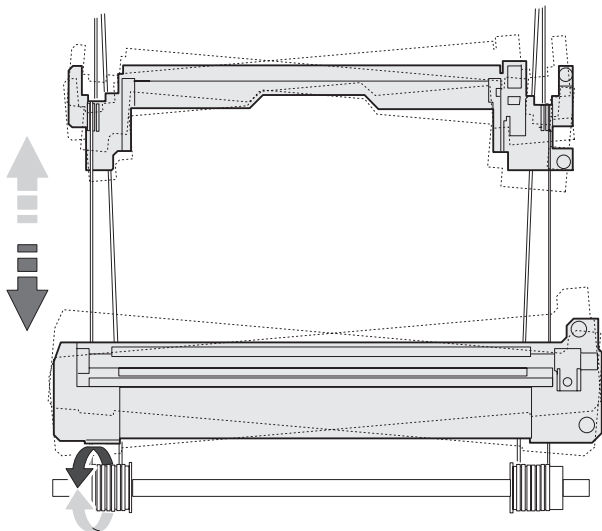
- 10) Check the horizontal image distortion.
If $LL = LR$, there is no horizontal distortion



- 11) If LL is not equal to LR , perform the following procedure.
Loosen the setscrew of the copy lamp unit/No.2/3 mirror unit drive pulley in the front or the rear frame.



- 12) Without moving the copy lamp unit/No.2/3 mirror unit drive pulley shaft, manually turn the copy lamp unit/No.2/3 mirror unit drive pulley whose setscrew was loosened, and adjust the parallelism of copy lamp unit/No.2/3 mirror unit.



- 13) Tighten the set screw of the copy lamp unit/No.2/3 mirror unit drive pulley.
14) Check the image distortion in the same manner as step 10).
Repeat procedures 11) to 14) until horizontal image distortion is eliminated.

b. Vertical image distortion adjustment

I. Summary

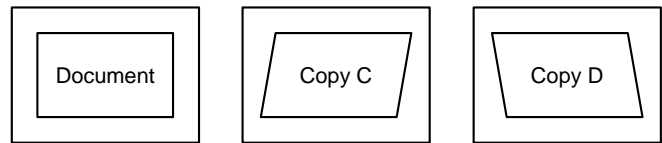
In this adjustment, the left and right balance is adjusted by changing the left and right balance of the No. 2 scanner unit frame on the front frame side.

II. Note

- Horizontal image distortion adjustment

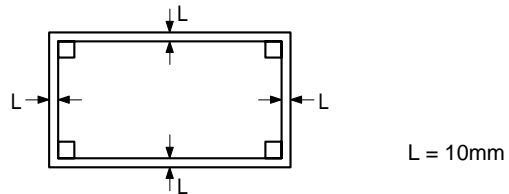
III. Cases when the adjustment is required

- 1) When the copy lamp unit/No.2/3 mirror unit drive section is disassembled or its part is replaced.
- 2) When the copy image is distorted as follows:



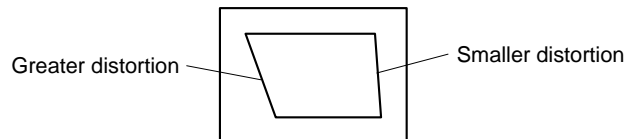
IV. Necessary tools

- Screwdriver (+)
- Screwdriver (-)
- Scale
- Test chart for distortion adjustment (Make by yourself.)
Draw a rectangle on A4 or $8\frac{1}{2}'' \times 11''$ paper as shown below:
Be sure to make four right angles.

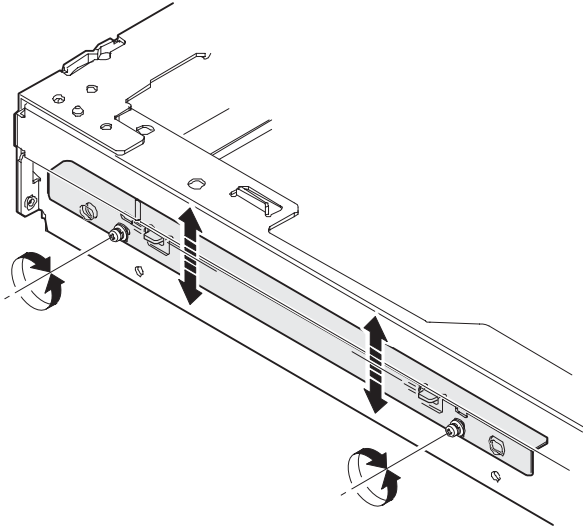


V. Adjustment procedure

- 1) Set the test chart for image distortion adjustment on the document glass, and make a normal copy on a paper of A4 or $8\frac{1}{2}'' \times 11''$.
- 2) Check image distortion in the right and the left sides.
If the both vertical lines are in parallel with each other, the right-left distortion balance is proper. (However, there may be some distortion.)
If all the four angles are right angles, there is no distortion and the following procedures are not required.



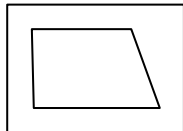
- 3) If the right-left distortion balance is improper, loosen the fixing screw of No.2/3 mirror unit rail to change and adjust the right-left balance of No.2/3 mirror unit rail.



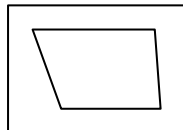
(Note)

If the distortion in the lead edge side (when viewed in the paper transport direction) is greater, change the height of the left rail of No.2/3 mirror unit.

If the distortion in the rear edge side (when viewed in the paper transport direction) is greater, change the height of the right rail of No.2/3 mirror unit.

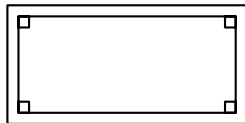


Change the height of the right side of the rail.



Change the height of the left side of the rail.

- 4) Make a copy to check the vertical image distortion. If the four angles are right angles, the adjustment is completed.



(2) Copy magnification ratio adjustment

The copy magnification ratio must be adjusted in the main scanning direction and in the sub scanning direction. To adjust, use SIM 48-1.

a. Outline

The main scanning (front/rear) direction magnification ratio adjustment is made automatically or manually.

Automatic adjustment: The width of the reference line marked on the shading correction plate is scanned to perform the main scanning (front/rear) direction magnification ratio adjustment automatically.

Manual adjustment: The adjustment is made by manual key operations. (In either of the automatic and manual adjustments, the zoom data register set value is changed for adjustment.)

The magnification ratio in the sub scanning direction is adjusted by changing the mirror base (scanner) scanning speed.

b. Main scanning direction magnification ratio adjustment

I. Note

Before performing this adjustment, the following adjustments must have been completed. If not, this adjustment cannot be performed properly.

- Image distortion adjustment
- The lens unit must be installed in the reference position.

II. Cases when the adjustment is required

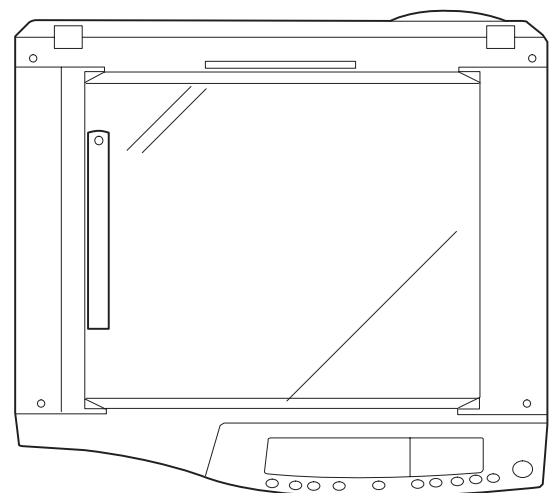
- 1) When the lens and the mirror unit are disassembled or the part is replaced.
- 2) When the copy lamp unit/No.2/3 mirror unit drive section is disassembled or the part is replaced.
- 3) When the main PWB is replaced.
- 4) When the EEPROM in the main PWB is replaced.
- 5) When "U2" trouble occurs.
- 6) When the copy image distortion adjustment is performed.

III. Necessary tools

- Screwdriver (+)
- Scale

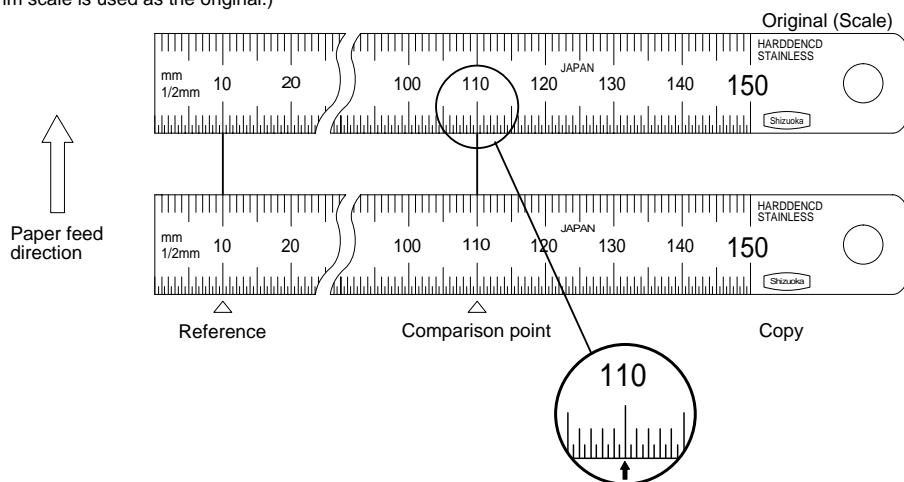
IV. Adjustment procedure

- 1) Set the scale vertically on the document table. (Use a long scale for precise adjustment.)



- 2) Set the copy magnification ratio to 100%.
- 3) Make a copy on A4 or 8½" × 11" paper.
- 4) Measure the length of the copied scale image.

(When a 100mm scale is used as the original.)



- 6) Check that the copy magnification ratio is within the specified range. If it is not within the specified range, perform the following procedures.
- 7) Execute SIM 48-1 to select the main scanning direction copy magnification ratio adjustment mode.
To select the adjustment mode, use the copy mode select key.

In the case of the automatic adjustment, when the PRINT switch is pressed, the mirror base unit moves to the white plate for shading to scan the width of the reference line, calculating the correction value and displaying and storing this value.

After execution of the automatic adjustment, go out from the simulation mode and make a copy to check the magnification ratio.

If the magnification ratio is not in the specified range (100 ±1.0%), manually adjust as follows.

Adjustment mode	Lighting lamp
Main scanning direction auto copy magnification ratio adjustment	Auto exposure lamp ON
Main scanning direction manual copy magnification ratio adjustment	Manual exposure lamp ON
Sub scanning direction copy magnification ratio adjustment	Photo exposure lamp ON

- 8) Set the adjustment mode to Manual with the copy mode select key.
- 9) Enter the new set value of main scanning direction copy magnification ratio with the copy quantity set key, and press the COPY button.
- 10) Change the set value and repeat the adjustment until the ratio is within the specified range.
When the set value is changed by 1, the magnification ratio is changed by 0.1%.

c. Sub scanning direction copy magnification ratio

I. Note

Before performing this adjustment, the following adjustments

- 5) Calculate the main scanning direction magnification ratio.

Main scanning direction magnification ratio

$$= \frac{\text{Copy image dimensions}}{\text{Original dimension}} \times 100 (\%)$$

must have been completed. If not, this adjustment cannot be performed properly.

- Image distortion adjustment
- Must be installed to the lens unit reference position.

II. Cases when the adjustment is required

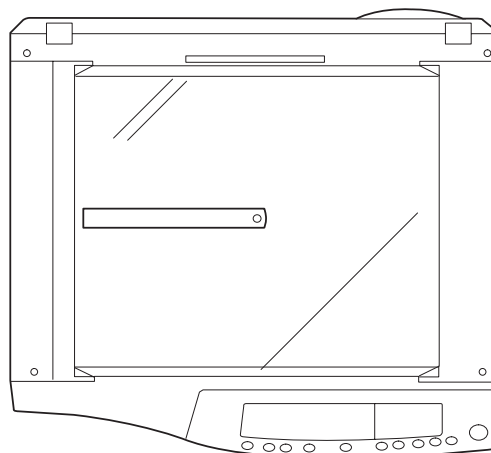
- 1) When the lens and the mirror unit are disassembled or the part is replaced.
- 2) When the scanner unit drive section is disassembled or the part is replaced.
- 3) When the main PWB is replaced.
- 4) When the EEPROM in the main PWB is replaced.
- 5) When "U2" trouble occurs.
- 6) When the copy image distortion adjustment is performed.

III. Necessary tools

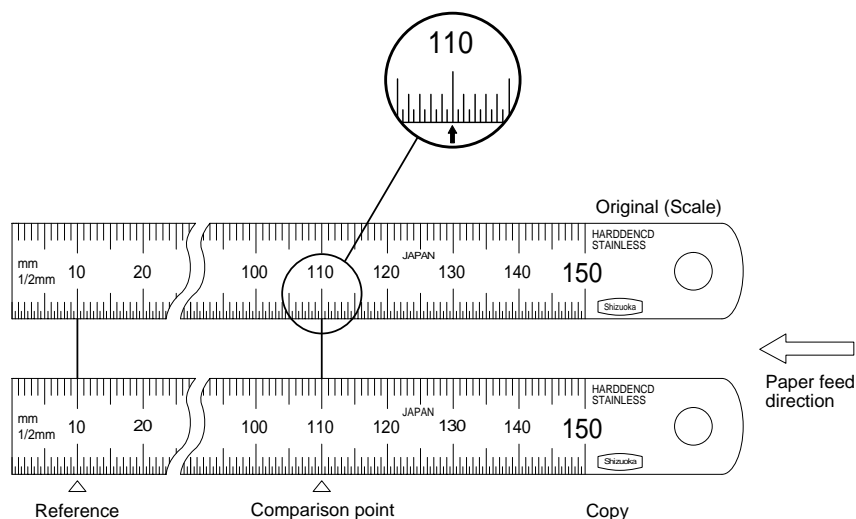
- Screwdriver (+)
- Scale

IV. Adjustment procedure

- 1) Set the scale on the document table as shown below.
(Use a long scale for precise adjustment.)



- 2) Set the copy magnification ratio to 100%.
- 3) Make a copy on A4 or 8½" × 11" paper.



- 4) Measure the length of the copied scale image.
- 5) Calculate the sub scanning direction copy magnification ratio.

Sub scanning direction copy magnification ratio

$$= \frac{\text{Copy image dimension}}{\text{Original dimension}} \times 100 (\%)$$

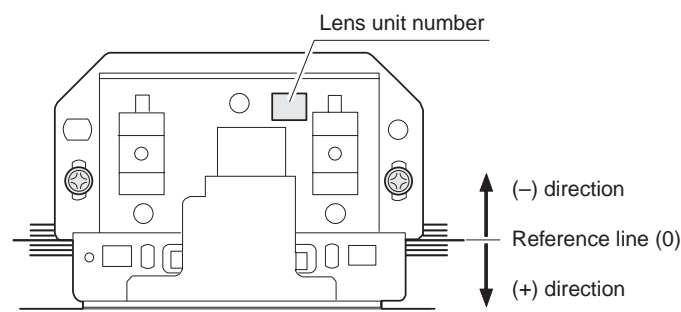
- 6) Check that the actual copy magnification ratio is within the specified range. ($100 \pm 1.0\%$).
If it is not within the specified range, perform the following procedures.
- 7) Execute SIM 48-1 to select the sub scanning direction copy magnification ratio adjustment mode.
To select the adjustment mode, use the copy mode select key. (Photo exposure lamp ON)
- 8) Enter the new set value of sub scanning direction copy magnification ratio with the copy quantity set key, and press the COPY button.

Repeat procedures 1) — 8) until the sub scanning direction actual copy magnification ratio in 100% copying is within the specified range.

When the set value is changed by 1, the magnification ration is changed by 0.1%.

(3) Lens unit attachment reference

Attach the lens unit so that the lens unit number on the lens adjustment plate is aligned with the scribe line on the base plate.



Example: Lens unit number -2.8

Attach the lens unit at 2 scales in the paper exit direction from the reference line.

Note: Never touch the other screws than the unit attachment screw.

The lens unit is supplied only in a whole unit.

(4) Image position adjustment

There are following five kinds of image position adjustments, which are made by laser control except for the image scan start position adjustment. For the adjustments, SIM 50 – 01 and SIM 50 – 10 are used.

No.	Adjustment item	Simulation
1	Print start position	50 – 01
2	Image lead edge void amount	50 – 01
3	Image scan start position	50 – 01
4	Image rear edge void amount	50 – 01
5	Center offset	50 – 10

To select the adjustment mode with SIM 50 – 01, use the copy density select key.

The relationship between the adjustment modes and the lighting lamps are as shown in the table below.

Adjustment mode	Lighting lamp
Print start position	Auto (AE) lamp
Image lead edge void amount	Manual (TEXT) lamp
Image scan start position	Photo lamp
Image rear edge void amount	Auto, Manual, Photo lamps

To select the adjustment mode with SIM 50 – 10, use the copy mode select key.

The relationship between the adjustment modes and the lighting lamps are as shown in the table below.

Machine with the multi manual paper feed unit

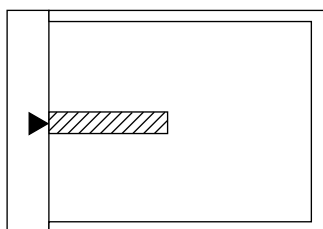
Adjustment mode	Lighting lamp
Print center offset (cassette)	Auto, Cassette
Print center offset (manual feed)	Auto, Manual
Document center offset	Auto, Manual

Machine with the single manual paper feed unit

Adjustment mode	Lighting lamp
Print center offset (cassette)	Auto, Cassette
Print center offset (manual feed)	Auto
Document center offset	Auto, Manual

1. Lead edge adjustment

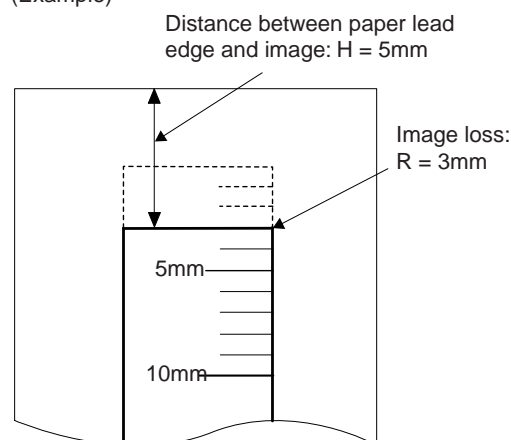
- 1) Set a scale to the center of the paper lead edge guide as shown below, and cover it with B4 or 8 1/2" × 14" paper.



- 2) Execute SIM 50 – 01
- 3) Set the print start position (AE lamp ON) (A), the lead edge void amount (TEXT lamp ON) (B), and the scan start position (PHOTO lamp ON) (C) to 0, and make a copy of a scale at 100%.

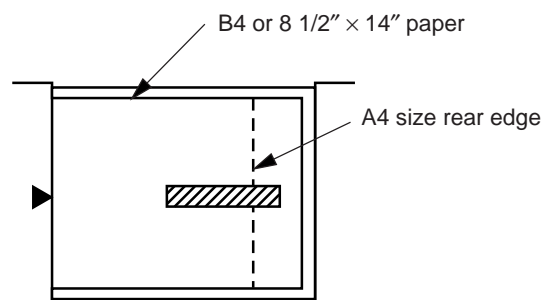
- 4) Measure the image loss amount (R mm) of the scale image.
Set $C = 10 \times R$ (mm). (Example: Set the value of C to 30.)
When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)
- 5) Measure the distance (H mm) between the paper lead edge and the image print start position.
Set $A = 10 \times H$ (mm). (Example: Set the value of A to 50.)
When the value of A is increased by 10, the image lead edge is shifted to the paper lead edge by 1mm. (Default: 50)
- 6) Set the lead edge void amount to $B = 50$ (2.5mm).
When the value of B is increased by 10, the void amount is increased by about 1mm. For 25 or less, however, the void amount becomes zero. (Default: 50)

(Example)

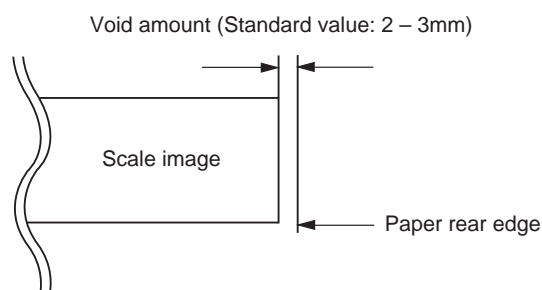


2. Image rear edge void amount adjustment

- 1) Set a scale to the rear edge section of A4 or 11" × 8 1/2" paper size as shown in the figure below, and cover it with B4 or 8 1/2" × 14" paper.



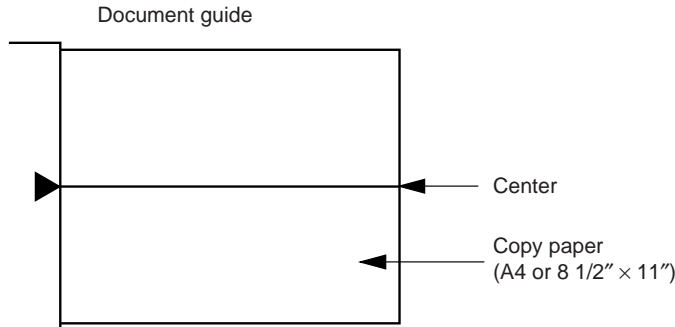
- 2) Execute SIM 50 – 01 to select the image rear edge void amount adjustment mode.
The set adjustment value is displayed on the copy quantity display.
- 3) Make a copy and measure the void amount of image rear edge.



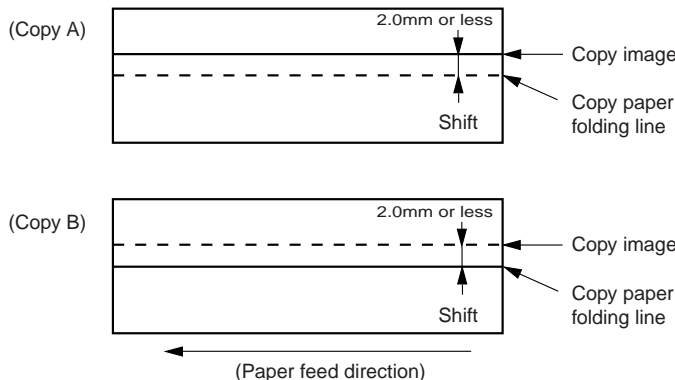
- 4) If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure. The default value is 50.

3. Center offset adjustment

- 1) Set the self-made test chart for the center position adjustment so that its center line is aligned with the center mark of the document guide.
- Test chart for the center position adjustment
Draw a line at the center of A4 or 8 1/2" × 11" paper in the paper transport direction.



- 2) Execute SIM 50 – 10 to select the print center offset (cassette paper feed) adjustment mode. The set adjustment value is displayed on the copy quantity display.
- 3) Make a copy and check that the copied center line is properly positioned. The standard value is $0 \pm 2\text{mm}$ from the paper center.



- 4) If the measured value is out of the specified range, change the set value and repeat the adjustment procedure. When the set value is increased by 1, the copy image is shifted by 0.1mm toward the rear frame.
- For the manual paper feed, change the manual paper feed adjustment mode and perform the similar procedures.
 - Since the document center offset is automatically adjusted by the CCD which scan the reference lines (F/R) on the back of document guide, there is no need to adjust manually.

2. Copy density adjustment

(1) Copy density adjustment timing

The copy density adjustment must be performed in the following cases:

- When maintenance is performed.
- When the developing bias/grid bias voltage is adjusted.
- When the optical section is cleaned.
- When a part in the optical section is replaced.
- When the optical section is disassembled.
- When the OPC drum is replaced.
- When the main control PWB is replaced.
- When the EEPROM on the main control PWB is replaced.
- When the memory trouble (U2) occurs.

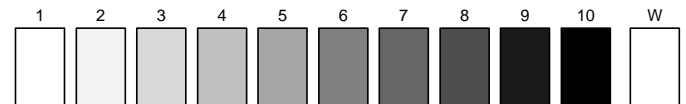
(2) Note for copy density adjustment

1) Arrangement before execution of the copy density adjustment

- Clean the optical section.
- Clean or replace the charger wire.
- Check that the voltage at the high voltage section and the developing bias voltage are in the specified range.

(3) Necessary tool for copy density adjustment

- One of the following test charts:
UKOG-0162FCZZ, UKOG-0089CSZZ, KODAK GRAY SCALE
- B4 (14" × 8 1/2") white paper
- The user program AE setting should be "3."



Test chart comparison table

UKOG-0162FCZZ DENSITY No.	1	2	3	4	5	6	7	8	9	10	W
UKOG-0089CSZZ DENSITY No.	0.1		0.2		0.3				0.5	1.9	0
KODAK GRAY SCALE		1		2		3		4		19	A

(4) Features of copy density adjustment

For the copy density adjustment, the image data shift function provided in the image process LSI is used.

List of the adjustment modes

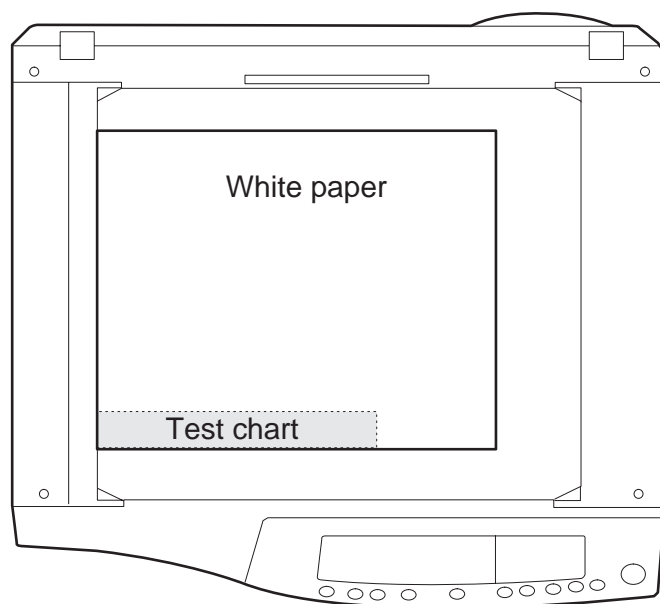
Auto Mode	Brightness 1 step only
Manual Mode	Brightness 5 steps. Adjustment of only the center brightness is made.
Photo Mode	Brightness 5 steps. Adjustment of only the center brightness is made.
Manual T/S mode	Brightness 5 steps. Adjustment of only the center brightness is made.
T/S Auto mode	Brightness 1 step only

(5) Copy density adjustment procedure

Use SIM 46-01 to set the copy density for each copy mode. For selection of modes, use the copy mode select key.

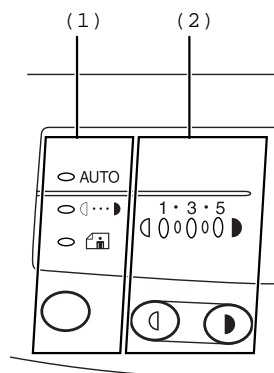
A. Test chart (UKOG-0162FCZZ) setting

- Place the test chart so that its edge is aligned with the A4 (Letter) reference line on the document table. Then place a B4 (14" × 8 1/2") white paper on the test chart and close the document cover.



B. Perform the adjustment in each mode.

- Execute SIM 46-1.
- Select the mode to be adjusted with the exposure mode select key. Set the exposure level to 3 for all adjustment. (Except for the auto mode.)



- (1) Mode select key/display lamp
(2) Exposure level select key/display lamp

Adjustment mode	Exposure mode display lamp	Exposure level	Sharp gray chart adjustment level
Auto mode	Auto lamp ON	—	"3" is slightly copied.
Manual mode	Manual lamp ON	3	"3" is slightly copied.
Photo mode	Photo lamp ON	3	"3" is slightly copied.
Manual T/S mode	Manual lamp/Photo lamp ON	3	"4" is slightly copied.
Auto T/S mode	Auto lamp/Photo lamp ON	3	"4" is slightly copied.

- Make a copy.
Check the adjustment level (shown in the above table) of the exposure test chart (Sharp Gray Scale).

	Sharp Gray Scale adjustment level
Non toner save mode	
Toner save mode	

(When too bright): Decrease the value displayed on the copy quantity display.

(When too dark): Increase the value displayed on the copy quantity display.

* The value can be set in the range of 1 — 99.

3. High voltage adjustment

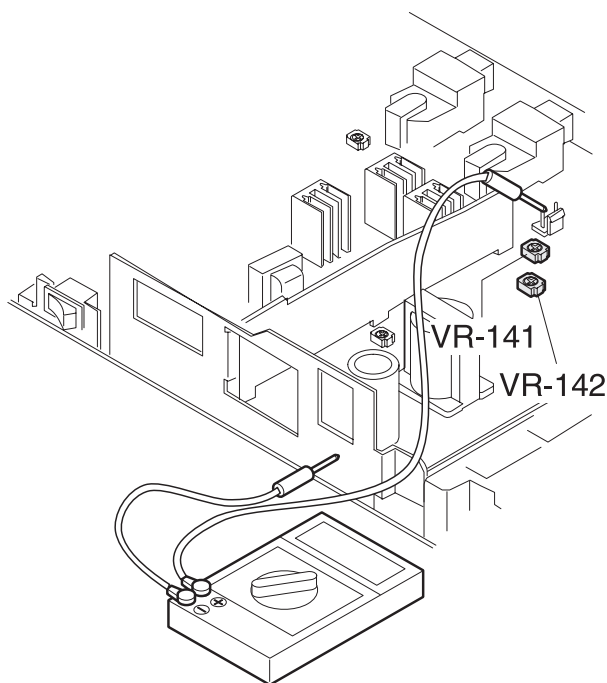
(1) Main charger (Grid bias)

Note:

- Use a digital multi meter with internal resistance of 10M Ω or more measurement.
- After adjusting the grid LOW output, adjust the HIGH output. Do not reverse the sequence.

Procedures

1. Set the digital multi meter range to DC700V.
2. Set the positive side of the test rod to the connector CN11-3 (GRID) of high voltage section of the power PWB and set the negative side to the frame ground (radiating plate).
3. Execute SIM 8-3. (The main charger output is supplied for 30 sec in the grid voltage LOW output mode.)
4. Adjust the control volume (VR-141) so that the output voltage is $-400 \pm 20V$.
5. Execute SIM 8-2. (The main charger output is supplied for 30 sec in the grid voltage HIGH output mode.)
6. Adjust the control volume (VR-142) so that the output voltage is $580 \pm 10V$.



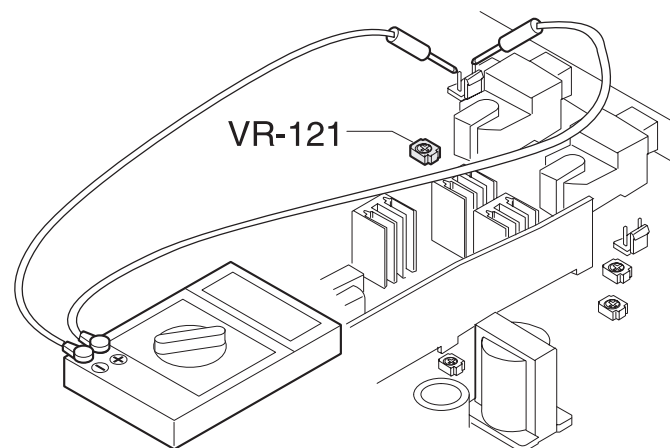
(2) DV bias adjustment

Note:

- A digital multi meter with internal resistance of 1G Ω must be use for correct adjustment.

Procedures

1. Set the digital multi meter range to DC500V.
2. Set the positive side of the test rod to the connector CN-10-1 (DV BIAS) and set the negative side to the connector CN10-2 (FG).
3. Execute SIM 8-1. (The developing bias is outputted for 30 sec.)
4. Adjust the control volume (VR-121) so that the output voltage is $-400 \pm 5V$.



[10] SIMULATION , TROUBLE CODES

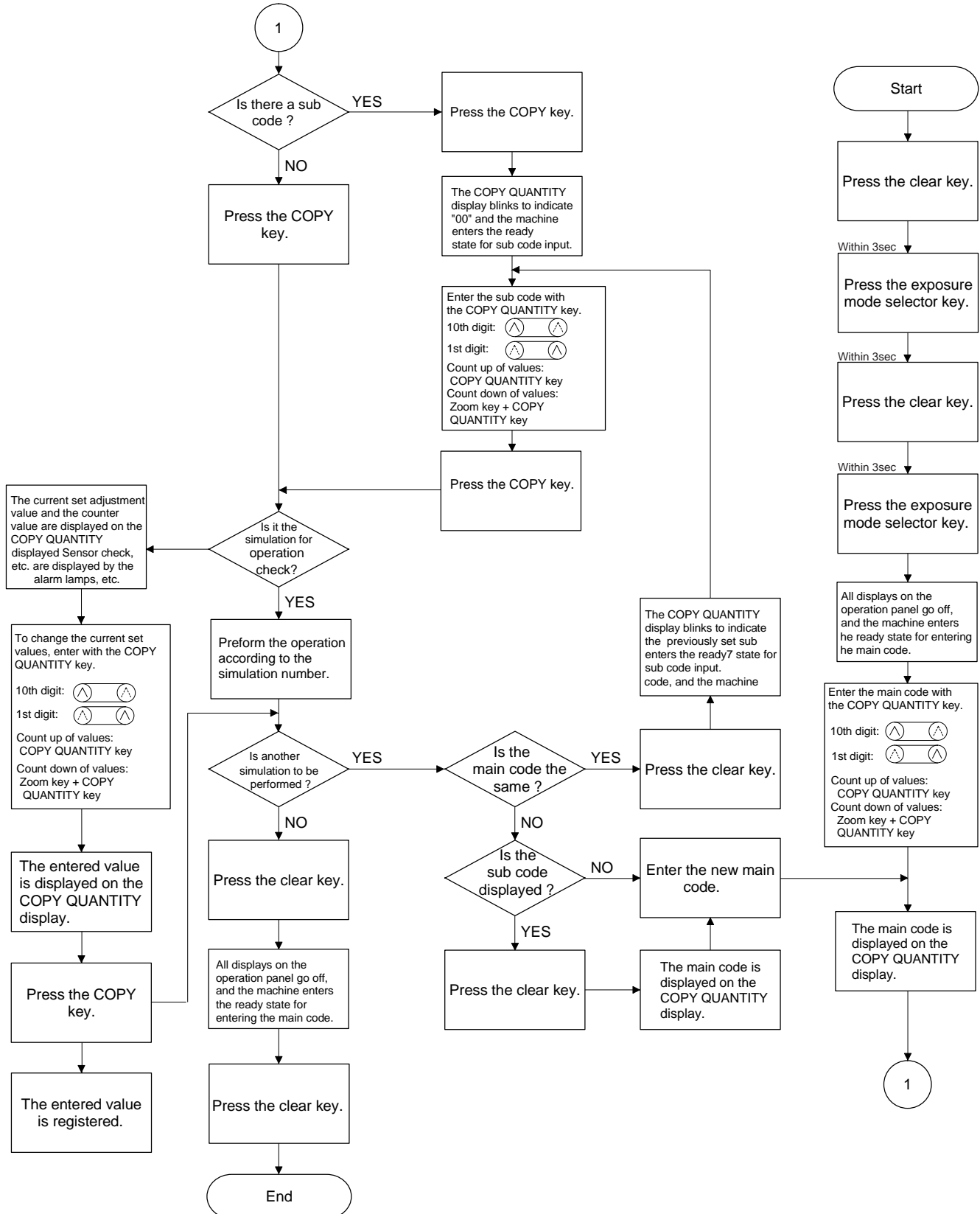
1.Entering the simulation mode

To enter the serviceman simulation mode, press the keys as follows:

Clear → Density select → Clear → Density select

To cancel the simulation mode, press the clear key.

Flow chart o entering the simulation mode



2. List of simulation

Main code	Sub code	Content
1	1	Scanner unit operation check
5	1	Operation panel display lamps operation check
	2	Fusing lamp and cooling fan operation check
	3	Copy lamp operation check
6	1	Paper feed solenoids (CPFS1, CPFS2, MPFS) operation check
	2	Resist solenoid (RRS) operation check
7	1	Warm-up time display and aging with JAM
	6	Intermittent aging
8	1	Developing bias check
	2	Main charger (Grid high output mode) check
	3	Grid voltage (Grid low output mode) check
	6	Transfer charger check
10	-	Toner motor operation check
14	-	Cancel of trouble other than U2
16	-	Cancel of U2 trouble
22	5	Total counter value display
	12	Drum counter value display
	14	P-ROM version display
	21	Scanner counter value display
24	7	Drum counter clear
	13	Scanner counter clear
25	1	Main motor operation check
	10	Polygon motor operation check
26	1	Manual paper feed section setting
	6	Destination setting
	7	Machine conditions check
	20	Rear edge void setting
	30	CE mark application control ON/OFF setting
	38	Drum life over stop cancel
	39	Memory capacity setting
	40	Polygon motor OFF time setting
30	42	Transfer ON timing control (Setting the time to transfer ON)
	1	Paper sensor status display
43	1	Fusing temperature setting
	4	Multi copy fusing temperature setting
46	1	Copy density adjustment
48	1	Front/rear scanning direction magnification ratio adjustment
50	1	Lead edge position and paper lead edge/rear edge void adjustment
	10	Center offset adjustment
51	2	Resist amount adjustment
61	3	Polygon motor (HSYNC output) check
63	1	Shading check
64	1	Self print by engine only (1 by 2 mode)

(*)In the simulation mode (except for the aging mode), when the 1-digit up key is pressed while pressing the % key, it serves as the 1-digit down key. When 10-digit up key is pressed while pressing the % key, it serves as the 10-digit down key.

3. Contents of simulations

Main code	Sub code	Contents				
1	1	Scanner unit operation check (Operation/Procedure) 1. When this simulation is executed, the mirror home position is detected. <table><tr><td>Sensor name</td><td>display lamp</td></tr><tr><td>Mirror home position sensor</td><td>OPC drum cartridge replacement lamp</td></tr></table> 2. When the _START key is pressed, scanning is executed at the speed corresponding to the currently set copy magnification ratio. The copy magnification ratio can be arbitrarily set with the magnification ratio select key/zoom key.	Sensor name	display lamp	Mirror home position sensor	OPC drum cartridge replacement lamp
		Sensor name	display lamp			
Mirror home position sensor	OPC drum cartridge replacement lamp					
5	1	Operation panel display lamps operation check (Operation/Procedure) When the START key is pressed, the LED on the operation panel is lighted for 5 sec.				
	2	Fusing lamp and cooling fan operation check (Operation/Procedure) When the START key is pressed, the fusing lamp repeats ON (500ms) and OFF (500msec) 5 times. During this period, the cooling fan rotates in the high speed mode. After completion of the operation, the cooling fan rotates in the low speed mode.				
	3	Copy lamp operation check (Operation/Procedure) When the START key is pressed, the copy lamp is lighted for 5 sec.				
6	1	Paper feed solenoids (CPFS1, CPFS2, MPFS) operation check (Operation/Procedure) When the START key is pressed, the paper feed solenoid selected by the tray select key repeats ON (500ms) and OFF (500ms) 20 times.				
	2	Resist solenoid (RRS) operation check (Operation/Procedure) When the START key is pressed, the resist solenoid (RRS) repeats ON (500ms) and OFF (500ms) 20 times.				
7	1	Warm-up time display and aging with JAM (Operation/Procedure) 1. When the simulation is executed, warming up is started. 2. Warm-up time is counted and displayed every second on the copy quantity display. 3. After completion of warm-up, the time count is stopped and the ready lamp is lighted. 4. Press the clear key to clear the warm-up time display, set the copy quantity, and press the START key, and the machine will copy the set quantity repeatedly.				
	6	Intermittent aging (Operation/Procedure) 1. When the simulation is executed, warming up is started. 2. After completion of warm-up, the ready lamp is lighted. 3. Set the copy quantity and press the START key, and the machine will copy the set quantity repeatedly. 4. After 3 sec of the interval time from completion of copying the set quantity, the machine will resume copying. 5. The above operation 4 is repeated.				

Main code	Sub code	Contents
8	1	Developing bias check (Operation/Procedure) When the START key is pressed, the developing bias is outputted for 30 sec.
	2	Main charger (Grid high output mode) check (Operation/Procedure) When the START key is pressed, the main charger output is supplied for 30 sec in the grid voltage HIGH mode.
	3	Grid voltage (Grid low output mode) check (Operation/Procedure) When the START key is pressed, the main charger output is supplied for 30 sec in the grid voltage LOW mode.
	6	Transfer charger check (Operation/Procedure) When the START key is pressed, the transfer charger output is supplied for 30 sec.
10	-	Toner motor operation check (Operation/Procedure) When the START key is pressed, the toner motor output is supplied for 30 sec.
14	-	Cancel of trouble other than U2 (Operation/Procedure) After canceling the trouble, the simulation is also automatically canceled.
16	-	Cancel of U2 trouble (Operation/Procedure) 1. When the START key is pressed, the EEPROM total counter check sum is rewritten and the trouble is canceled. 2. After canceling the trouble, the simulation is also automatically canceled.
22	5	Total counter value display (Operation/Procedure) The total counter value is divided into two 3-digit sections and displayed on the copy quantity display repeatedly. Example of display In the case of 12345 012 → Blank → 345 → Blank → 012 0.7s 0.3s 0.7s 1.0s 0.3s
	12	Drum counter value display (Operation/Procedure) The installed drum counter value is divided into two 3-digit sections and displayed on the copy quantity display repeatedly. * The display method is same as the total counter value display.
	14	P-ROM version display (Operation/Procedure) The P-ROM version is displayed in 3 digits on the copy quantity display.
	21	Scanner counter value display The installed scanner counter value is divided into two 3-digit sections and displayed on the copy quantity display repeatedly. * The display method is same as the total counter value display.

Main code	Sub code	Contents							
24	7	Drum counter clear (Operation/Procedure) When the START key is pressed, the drum counter value is reset to 0.							
	13	Scanner counter clear (Operation/Procedure) When the START key is pressed, the scanner counter value is reset to 0.							
25	1	Main motor operation check (Operation/Procedure) When the START key is pressed, the main motor is rotated for 30 sec. To save toner consumption, the different operations are executed depending on installation of the developing unit. . When the developing unit is installed, the developing bias, the main charger, and the grid are also outputted. . When the developing unit is not installed, only the motor is rotated. * Do not turn on the door open/close switch forcibly to execute this simulation.							
	10	Polygon motor operation check (Operation/Procedure) When the START key is pressed, the polygon motor is operated for 30sec.							
26	1	Manual paper feed section setting (Operation/Procedure) 1. When this simulation is executed, the currently set bypass code number is displayed. 2. Enter the code number corresponding to the bypass and press the START key, and the setting will be changed. <table><tr><td>Code number</td><td>Bypass</td></tr><tr><td>0</td><td>Single bypass</td></tr><tr><td>1</td><td>Multi bypass</td></tr></table>	Code number	Bypass	0	Single bypass	1	Multi bypass	
	Code number	Bypass							
	0	Single bypass							
1	Multi bypass								
6	Destination setting (Operation/Procedure) 1. When this simulation is executed, the currently set destination code number is displayed. 2. Enter the code number corresponding to the destination and press the START key, and the setting will be changed. <table><tr><td>Code number</td><td>Destination</td></tr><tr><td>0</td><td>Inch series</td></tr><tr><td>1</td><td>EX AB series</td></tr><tr><td>2</td><td>Japan AB series</td></tr></table>	Code number	Destination	0	Inch series	1	EX AB series	2	Japan AB series
Code number	Destination								
0	Inch series								
1	EX AB series								
2	Japan AB series								
7	Machine conditions check (Operation/Procedure) When this simulation is executed, the current machine setting is displayed. <table><tr><td>CPM</td><td>Copy quantity display</td></tr><tr><td>10cpm</td><td>10</td></tr><tr><td>12cpm</td><td>12</td></tr><tr><td>15cpm</td><td>15</td></tr></table>	CPM	Copy quantity display	10cpm	10	12cpm	12	15cpm	15
CPM	Copy quantity display								
10cpm	10								
12cpm	12								
15cpm	15								

Main code	Main code	Contents																					
26	20	<p>Rear edge void setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number of rear edge void setting is displayed.</p> <p>2. Enter the code number of rear edge void setting and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Rear edge void setting</th></tr><tr><td>0</td><td>Rear edge void allowed</td></tr><tr><td>1</td><td>Rear edge void not allowed</td></tr></table>	Code number	Rear edge void setting	0	Rear edge void allowed	1	Rear edge void not allowed															
	Code number	Rear edge void setting																					
	0	Rear edge void allowed																					
	1	Rear edge void not allowed																					
	30	<p>CE mark application control ON/OFF setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number of CE mark application is displayed.</p> <p>2. Enter the code number of CE mark application and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>CE mark application setting</th></tr><tr><td>0</td><td>CE mark application control OFF</td></tr><tr><td>1</td><td>CE mark application control ON</td></tr></table>	Code number	CE mark application setting	0	CE mark application control OFF	1	CE mark application control ON															
Code number	CE mark application setting																						
0	CE mark application control OFF																						
1	CE mark application control ON																						
38	<p>Drum life over stop cancel (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>0</td><td>Stop at drum life over</td></tr><tr><td>1</td><td>Stop cancel at drum life over</td></tr></table>	Code number	Setting	0	Stop at drum life over	1	Stop cancel at drum life over																
Code number	Setting																						
0	Stop at drum life over																						
1	Stop cancel at drum life over																						
39	<p>Memory capacity setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>0</td><td>No memory</td></tr><tr><td>1</td><td>4Mbyte</td></tr><tr><td>2</td><td>6Mbyte</td></tr></table>	Code number	Setting	0	No memory	1	4Mbyte	2	6Mbyte														
Code number	Setting																						
0	No memory																						
1	4Mbyte																						
2	6Mbyte																						
40	<p>Polygon motor OFF time setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>0</td><td>0 sec</td></tr><tr><td>1</td><td>30 sec</td></tr><tr><td>2</td><td>60 sec</td></tr><tr><td>3</td><td>90 sec</td></tr></table>	Code number	Setting	0	0 sec	1	30 sec	2	60 sec	3	90 sec												
Code number	Setting																						
0	0 sec																						
1	30 sec																						
2	60 sec																						
3	90 sec																						
42	<p>Transfer ON timing control (Setting the time to transfer ON) (Operation / Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed. (For any number different from the following ones, the default time is automatically set.)</p> <table><tr><th>Code number</th><th>Setting</th></tr><tr><td>0</td><td>Default (330 msec)</td></tr><tr><td>1</td><td>-40msec</td></tr><tr><td>2</td><td>-30msec</td></tr><tr><td>3</td><td>-20msec</td></tr><tr><td>4</td><td>-10msec</td></tr><tr><td>5</td><td>Default (330 msec)</td></tr><tr><td>6</td><td>+10msec</td></tr><tr><td>7</td><td>+20msec</td></tr><tr><td>8</td><td>+30msec</td></tr><tr><td>9</td><td>+40msec</td></tr></table>	Code number	Setting	0	Default (330 msec)	1	-40msec	2	-30msec	3	-20msec	4	-10msec	5	Default (330 msec)	6	+10msec	7	+20msec	8	+30msec	9	+40msec
Code number	Setting																						
0	Default (330 msec)																						
1	-40msec																						
2	-30msec																						
3	-20msec																						
4	-10msec																						
5	Default (330 msec)																						
6	+10msec																						
7	+20msec																						
8	+30msec																						
9	+40msec																						

Main code	Main code	Main code														
30	1	<p>Paper sensor status display (Operation/Procedure)</p> <p>The paper sensor status is displayed on the copy quantity display.</p> <table><tr><th>Sensor name</th><th>Display lamp</th></tr><tr><td>Resist front paper sensor(PPD1)</td><td>Developing lamp replacement lamp</td></tr><tr><td>Fusing section paper sensor (PPD2)</td><td>JAM lamp</td></tr><tr><td>Paper exit sensor (PDD)</td><td>OPC drum cartridge replacement lamp</td></tr><tr><td>New drum cartridge sensor (PUIS)</td><td>Zoom lamp</td></tr><tr><td>2nd CS paper sensor (PPD3)</td><td>2nd cassette lamp</td></tr><tr><td>Single manual feed paper detection(MFD)</td><td>AE lamp</td></tr></table>	Sensor name	Display lamp	Resist front paper sensor(PPD1)	Developing lamp replacement lamp	Fusing section paper sensor (PPD2)	JAM lamp	Paper exit sensor (PDD)	OPC drum cartridge replacement lamp	New drum cartridge sensor (PUIS)	Zoom lamp	2nd CS paper sensor (PPD3)	2nd cassette lamp	Single manual feed paper detection(MFD)	AE lamp
Sensor name	Display lamp															
Resist front paper sensor(PPD1)	Developing lamp replacement lamp															
Fusing section paper sensor (PPD2)	JAM lamp															
Paper exit sensor (PDD)	OPC drum cartridge replacement lamp															
New drum cartridge sensor (PUIS)	Zoom lamp															
2nd CS paper sensor (PPD3)	2nd cassette lamp															
Single manual feed paper detection(MFD)	AE lamp															
43	1	<p>Fusing temperature setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Set temperature (°C)</th></tr><tr><td>0</td><td>175</td></tr><tr><td>1</td><td>180</td></tr><tr><td>2</td><td>185</td></tr><tr><td>3</td><td>190 (*Default)</td></tr><tr><td>4</td><td>195</td></tr><tr><td>5</td><td>200</td></tr></table>	Code number	Set temperature (°C)	0	175	1	180	2	185	3	190 (*Default)	4	195	5	200
	Code number	Set temperature (°C)														
0	175															
1	180															
2	185															
3	190 (*Default)															
4	195															
5	200															
	4	<p>Multi copy fusing temperature setting (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set code number is displayed.</p> <p>2. Enter the code number and press the START key, and the setting will be changed.</p> <table><tr><th>Code number</th><th>Set temperature (°C)</th></tr><tr><td>0</td><td>155</td></tr><tr><td>1</td><td>160</td></tr><tr><td>2</td><td>165 (*Default)</td></tr><tr><td>3</td><td>170</td></tr><tr><td>4</td><td>175</td></tr><tr><td>5</td><td>180</td></tr></table> <p>* To suppress temperature rise in the machine during multi copying,the fusing temperature is automatically changed from the level set with SIM 43-1 to the level set with this simulation after 20 sheets of multi copy.</p>	Code number	Set temperature (°C)	0	155	1	160	2	165 (*Default)	3	170	4	175	5	180
Code number	Set temperature (°C)															
0	155															
1	160															
2	165 (*Default)															
3	170															
4	175															
5	180															
46	1	<p>Copy density adjustment (Outline)</p> <p>Used to adjust the copy density in each copy mode.(The copy density can be set by changing the set value of ASIC GAMMA ADJUST register.)</p> <p>Setting in each copy mode is performed at exposure level 3. When the copy density (exposure) is adjusted arbitrarily, the max, and min. exposure levels are automatically calculated and set. (The change amounts (gradient, change amount) at level 1 - 5 are predetermined.)</p> <p>(Operation/Procedure)</p> <p>1. When this simulation is executed, warming up and shading are performed and the current set value is displayed in two digits.</p> <p>2. Press the copy mode select key to select each setting mode and setting display.</p> <p>* The copy mode setting is indicated with the following lamps as shown below.</p> <p>3. Change the setting with the value up-down key and press the START key, and a copy will be made with the entered set value.</p> <p>4. Press the clear key to store the set value and exit the simulation.</p> <table><tr><th>Copy mode</th><th>Display lamp</th></tr><tr><td>AE mode</td><td>AE mode lamp</td></tr><tr><td>TEXT mode</td><td>TEXT mode lamp</td></tr><tr><td>PHOTO mode</td><td>PHOTO mode lamp</td></tr><tr><td>TS mode (TEXT)</td><td>TEXT mode lamp & PHOTO mode lamp</td></tr><tr><td>TS mode (AE)</td><td>AE mode lamp & PHOTO mode lamp</td></tr></table>	Copy mode	Display lamp	AE mode	AE mode lamp	TEXT mode	TEXT mode lamp	PHOTO mode	PHOTO mode lamp	TS mode (TEXT)	TEXT mode lamp & PHOTO mode lamp	TS mode (AE)	AE mode lamp & PHOTO mode lamp		
Copy mode	Display lamp															
AE mode	AE mode lamp															
TEXT mode	TEXT mode lamp															
PHOTO mode	PHOTO mode lamp															
TS mode (TEXT)	TEXT mode lamp & PHOTO mode lamp															
TS mode (AE)	AE mode lamp & PHOTO mode lamp															

Main code	Main code	Main code																														
46	1	<div>Relationship between the displayed values and the GAMMA ADJUST register</div> <table><tr><td></td><td>Exp1</td><td>Exp2</td><td>Exp3</td><td>Exp4</td><td>Exp5</td></tr><tr><td>AE</td><td>-24</td><td>-12</td><td>0</td><td>+12</td><td>+24</td></tr><tr><td>TEXT</td><td>-24</td><td>-12</td><td>0</td><td>+12</td><td>+24</td></tr><tr><td>PHOTO</td><td>-24</td><td>-12</td><td>0</td><td>+12</td><td>+24</td></tr><tr><td>T/S</td><td>-24</td><td>-12</td><td>0</td><td>+12</td><td>+24</td></tr></table> <div>The value displayed after execution of this simulation can be set in the range of 0 - 99 with 50 as the center value. When the text mode set value is Gat3, for example, the GAMMA ADJUST register value set at Exp1 is: Text Exp1 = Gat3 - 50 - 24 When 40 is set to Gat3, Text Exp1 = 40 - 50 - 24 = -34 Then set the GAMMA ADJUST register set value to -34. Perform the same procedure for each mode and each Exp. * The above table may subject to change. * For the gradient, there is a similar table, though not specified here. The value set with SIM 46, however, is not reflected. * The AE mode Exp selection is not specified, but corresponds to the grades for AE exposure selection in the former models.</div>		Exp1	Exp2	Exp3	Exp4	Exp5	AE	-24	-12	0	+12	+24	TEXT	-24	-12	0	+12	+24	PHOTO	-24	-12	0	+12	+24	T/S	-24	-12	0	+12	+24
	Exp1	Exp2	Exp3	Exp4	Exp5																											
AE	-24	-12	0	+12	+24																											
TEXT	-24	-12	0	+12	+24																											
PHOTO	-24	-12	0	+12	+24																											
T/S	-24	-12	0	+12	+24																											
48	1	<div>Front/rear scanning direction magnification ratio adjustment (Outline)</div> <div>(1) Front/rear scanning direction magnification ratio auto correction: (Performed by changing the set value of ZOOM DATA register for ASIC.) The width of the reference line marked on the shading correction plate is scanned to perform the front/rear direction magnification ratio adjustment automatically. (Performed by changing the set value of ZOOM DATA register for ASIC.)</div> <div>(2) Front/rear scanning direction magnification ratio manual correction: Used to set the front/rear (main scanning) direction magnification ratio by key operations. (Performed by changing the set value of ZOOM DATA register for ASIC.)</div> <div>(3) Scanning direction magnification ratio correction: The scanning direction magnification ratio in the OC mode is set by key operations. (Performed by changing the scanning speed.)</div> <div>(4) SPF mode scanning direction magnification ratio correction: The scanning direction magnification ratio in the OC mode is set by key operations. (Performed by changing the scanning speed.)</div> <div>(Operation/Procedure)</div> <div>1. When this simulation is executed, the current set value is displayed in two digits. (Center value: 50)</div> <div>2. When the copy mode select key is pressed, the setting mode and the setting display are changed sequentially.</div> <div>* The selected adjustment mode is indicated by the lamps as follows:</div> <div>3. In the front/rear scanning direction adjustment, when the START key is pressed, the mirror base unit moves to the white plate for shading and the width of the reference line is read and the correction value is calculated and displayed and the value is stored.</div> <div>In the case of the manual adjustment, enter the adjustment value with the 10-key and press the START key. Then the entered value is stored and a copy is made. (An increase of 1 in the set value corresponds to an increase of 1%.)</div> <div>4. Press the clear key to store the set value and exit the simulation.</div> <table><tr><td>Adjustment mode</td><td>Lamps ON</td></tr><tr><td>Front/rear direction magnification ratio auto correction</td><td>AE lamp</td></tr><tr><td>Front/rear direction magnification ratio manual correction</td><td>TEXT lamp</td></tr><tr><td>Scanning direction magnification ratio correction</td><td>PHOTO lamp</td></tr><tr><td>SPF mode scanning direction magnification ratio correction</td><td>AE, TEXT, PHOTO lamps</td></tr></table> <div>In the front-rear direction magnification ratio correction:</div> <div>(1) The result of calculation of the scan correction value is +-5% or less, "- -" is displayed.</div> <div>(Cause) The white plate reference position error or the lens unit installing error</div> <div>(2) In case of a scanning error of the reference line, the JAM lamp is turned on.</div> <div>(Cause) CCD error or no white plate</div> <div>*) If the automatic correction of magnification ratio does not work properly, adjust and correct manually.</div>	Adjustment mode	Lamps ON	Front/rear direction magnification ratio auto correction	AE lamp	Front/rear direction magnification ratio manual correction	TEXT lamp	Scanning direction magnification ratio correction	PHOTO lamp	SPF mode scanning direction magnification ratio correction	AE, TEXT, PHOTO lamps																				
Adjustment mode	Lamps ON																															
Front/rear direction magnification ratio auto correction	AE lamp																															
Front/rear direction magnification ratio manual correction	TEXT lamp																															
Scanning direction magnification ratio correction	PHOTO lamp																															
SPF mode scanning direction magnification ratio correction	AE, TEXT, PHOTO lamps																															

Main code	Sub code	Contents																					
50	1	<p>Lead edge position and paper lead edge/rear edge void adjustment</p> <p>Used to adjust the copy image position on copy paper and the lead edge/rear edge void amounts. Performed by adjusting the scanning start position and print start position (resist roller ON timing) in 100%. (Operation/Procedure)</p> <p>1. When this simulation is executed, the current set value is displayed in two digits. (Center value: 50)</p> <p>2. When the copy mode select key is pressed, the setting mode and the setting display are changed sequentially.</p> <p>* The selected adjustment mode is indicated by the lamps as follows.</p> <p>3. Enter the adjustment value with the 10-key and press the START key. Then the set value is stored and copy is made. (An increase of 1 in the set value corresponds to 0.1mm shift.)</p> <p>4. Press the clear key to store the set value and exit the simulation.</p> <table><tr><td>Adjustment mode</td><td>Lamps ON</td></tr><tr><td>Print start position</td><td>AE lamp</td></tr><tr><td>Image lead edge void amount</td><td>TEXT lamp</td></tr><tr><td>Image scanning start position (Scanner)</td><td>PHOTO lamp</td></tr><tr><td>Image rear edge void amount</td><td>AE, TEXT, PHOTO lamps</td></tr></table>	Adjustment mode	Lamps ON	Print start position	AE lamp	Image lead edge void amount	TEXT lamp	Image scanning start position (Scanner)	PHOTO lamp	Image rear edge void amount	AE, TEXT, PHOTO lamps											
	Adjustment mode	Lamps ON																					
Print start position	AE lamp																						
Image lead edge void amount	TEXT lamp																						
Image scanning start position (Scanner)	PHOTO lamp																						
Image rear edge void amount	AE, TEXT, PHOTO lamps																						
10	<p>Center offset adjustment (Outline)</p> <p>Used to adjust the copy image position on copy paper and the center offset position in scanning an original. Performed by changing the set values of the SCAN LEFT MARGIN register and the PRINT LEFT MARGIN register of ASIC. (Operation/Procedure)</p> <p>1. When this simulation is executed, the current set value is displayed.</p> <p>2. In a machine with the multi paper feed unit installed, press the copy mode select key, and each setting mode and display are changed sequentially.</p> <p>In a machine with the single paper feed unit installed, press the copy mode select key, and each setting mode and display are changed sequentially.</p> <p>* The selected adjustment mode is indicated by the lamps as follows:</p> <p>3. Enter the adjustment value with the 10-key and press the SORT key. Then the set value is stored and a copy is made. (An increase of 1 in the set value corresponds to 0.1mm shift.)</p> <p>4. Press the clear key to store the set value and exit the simulation.</p> <p>* Machine with the multi manual paper feed unit installed</p> <table><tr><td>Adjustment mode</td><td>Lamps ON</td></tr><tr><td>Print center offset (main cassette paper feed)</td><td>AE, main cassette lamp</td></tr><tr><td>Print center offset (2nd cassette paper feed)</td><td>AE, 2nd cassette lamp</td></tr><tr><td>Print center offset (Manual paper feed)</td><td>AE, manual feed lamp</td></tr><tr><td>OC/original center offset</td><td>AE, TEXT lamp</td></tr><tr><td>SPF/Original center offset</td><td>AE, TEXT, PHOTO lamp</td></tr></table> <p>* Machine with the single manual paper feed unit installed</p> <table><tr><td>Adjustment mode</td><td>Lamps ON</td></tr><tr><td>Print center offset (main cassette paper feed)</td><td>AE, main cassette lamp</td></tr><tr><td>Print center offset (Manual paper feed)</td><td>AE (Blink)</td></tr><tr><td>OC/original center offset</td><td>AE, TEXT lamp</td></tr><tr><td>SPF/Original center offset</td><td>AE, TEXT, PHOTO lamp</td></tr></table>	Adjustment mode	Lamps ON	Print center offset (main cassette paper feed)	AE, main cassette lamp	Print center offset (2nd cassette paper feed)	AE, 2nd cassette lamp	Print center offset (Manual paper feed)	AE, manual feed lamp	OC/original center offset	AE, TEXT lamp	SPF/Original center offset	AE, TEXT, PHOTO lamp	Adjustment mode	Lamps ON	Print center offset (main cassette paper feed)	AE, main cassette lamp	Print center offset (Manual paper feed)	AE (Blink)	OC/original center offset	AE, TEXT lamp	SPF/Original center offset	AE, TEXT, PHOTO lamp
Adjustment mode	Lamps ON																						
Print center offset (main cassette paper feed)	AE, main cassette lamp																						
Print center offset (2nd cassette paper feed)	AE, 2nd cassette lamp																						
Print center offset (Manual paper feed)	AE, manual feed lamp																						
OC/original center offset	AE, TEXT lamp																						
SPF/Original center offset	AE, TEXT, PHOTO lamp																						
Adjustment mode	Lamps ON																						
Print center offset (main cassette paper feed)	AE, main cassette lamp																						
Print center offset (Manual paper feed)	AE (Blink)																						
OC/original center offset	AE, TEXT lamp																						
SPF/Original center offset	AE, TEXT, PHOTO lamp																						
51	2	<p>Resist amount adjustment (Outline)</p> <p>Used to adjust the contact pressure of paper onto the copier resist roller and the SPF resist roller. (Operation/Procedure)</p> <p>1. When this simulation is executed, the currently set value is displayed.</p> <p>2. In a machine with the multi paper feed unit installed, press the copy mode select key, and each setting mode and display are changed sequentially.</p> <p>In a machine with the single paper feed unit installed, press the copy mode select key, and each setting mode and display are changed sequentially.</p> <p>* The selected adjustment mode is indicated by the lamps as follows:</p> <p>3. Enter the adjustment value with the 10-key and press the SORT key. Then the set value is stored and a copy is made.</p> <p>4. Press the clear key to store the set value and exit the simulation.</p>																					

Main code	Sub code	Contents	
51	2	* Machine with the multi manual paper feed unit installed	
		Adjustment mode	Lamps ON
		Main cassette paper feed	AE, main cassette lamp
		2nd cassette paper feed	AE, 2nd cassette lamp
		Manual paper feed	AE, manual feed lamp
		SPF/Resist	AE, TEXT, PHOTO lamp
		* Machine with the single manual paper feed unit installed	
		Adjustment mode	Lamps ON
		Main cassette paper feed	AE, main cassette lamp
Manual paper feed	AE (Blink)		
SPF/Resist	AE, TEXT, PHOTO lamp		
61	3	Polygon motor (HSYNC output) check (Operation/Procedure) When the START key is pressed, HSYNC is performed and the polygon motor is rotated for 30 sec. At that time, the Zoom lamp is lighted for 100msec every time when HSYNC is detected.	
63	1	Shading check (Outline) Used to display the detection level of the white plate for shading. (Vref of AD conversion IC is fixed.) (Operation/Procedure) When the START key is pressed, the mirror base unit moves to the white plate for shading and Vref+ voltage of AD conversion IC is set to 4.5V and Vref- voltage to 0.5V, and the copy lamp is lighted. This state is kept for 10 sec, and the level of one pixel at the center is detected every second to display on the value display section.	
64	1	Self print by engine only (1 by 2 mode) (Outline) Used to print the set quantity in 1 by 2 mode ignoring the optical system state. (Operation/Procedure) 1. When this simulation is executed, warming up is performed and the ready lamp is lighted. 2. Enter the copy quantity with the 10-key, select the cassette with the cassette select key, and press the START key. Paper is fed from the cassette and printing is performed. In 1 by 2 print mode, one line is printed and the following two lines are not printed.	

4. Trouble Codes

Main code	Sub code	Trouble content	Detail of trouble
E7	03	HSYNC cannot be detected.	LSU (laser diode, reception element, APC circuit) trouble LSU drive circuit (ASIC) trouble
E7	04	CCD white level trouble	CCD drive circuit (CCD PWB, ASIC harness) trouble Copy lamp lighting trouble (Copy lamp, inverter PWB)
E7	05	CD black level trouble	CCD drive circuit (CCD PWB, ASIC, harness) trouble
E7	12	Shading trouble (white correction)	Dirt on white plate for scanning white level
E7	14	ASIC connection trouble	Improper connection between CPU and ASIC (pattern cut, improper connection of lead pin)
E7	15	Copy lamp OFF trouble	Copy lamp or copy lamp drive circuit (inverter PWB) trouble Copy lamp disconnection
L1	00	Feed is not completed within the specified time.	When the mirror base is returned for the specified time (6 sec) in mirror initializing after turning on the power, the mirror home position sensor (MHPS) does not turn OFF. Or when the mirror base is fed for the specified time (about 6 sec) after start of copy return, the mirror home position sensor (MHPS) does not turn OFF.
L3	00	Return is not completed within the specified time.	When the mirror base is returned for the specified time (6 sec) in mirror initializing after turning on the power, the mirror home position sensor (MHPS) does not turn ON. Or when the mirror base is returned for the specified time (about 6 sec) after start of copy return, the mirror home position sensor (MHPS) does not turn ON.
L4	01	Main motor lock	When the main motor encoder pulse is not detected for 100msec.
L6	10	Polygon motor lock	The lock signal (specified rpm signal) does not return within a certain time (about 20sec) from starting the polygon motor rotation
H2	00	Thermistor open detection	The fusing thermistor is open.
H3	00	Heat roller abnormally high temperature	The fusing temperature rises above 240°C.
H4	00	Heat roller abnormally low temperature	The fusing temperature does not reach 185°C within 27 sec of turning on the power, or the fusing temperature keeps at 140°C.
U2	01	Counter sum check error	When the counter check sum value stored in the EEPROM is abnormal.
U2	04	EEPROM serial communication error	When a communication trouble occurs with the EEPROM.
CH (Blinking)	-	TD cartridge not installed	Check if TD cartridge is installed.

[11] USER PROGRAM

The conditions of factory setting can be changed according to the use conditions.

Functions which can be set with the user program




Function	Contents	Factory setting
Auto clear.	<ul style="list-style-type: none"> When a certain time is passed after completion of copying, this function returns to the initial state automatically. The time to reach the initial state can be set in the range of 30 sec to 120 sec by the unit of 30 sec. This function can be disabled. 	60 sec
Pre-heat.	<ul style="list-style-type: none"> When the copier is left unused with the power ON, the power consumption is automatically reduced to about 40Wh/H (* Note). The time to start this function can be set in the range of 30 sec to 90 sec by the unit of 30 sec. This function cannot be disabled. When this function is operated, the pre-heat lamp on the operation panel lights up. To return to the initial state, press any key on the operation panel. (When the COPY button is pressed, a copy is made after returning to the initial state.) 	90 sec
Auto shut off passing time.	<ul style="list-style-type: none"> When the copier is left unused with the power ON, the power consumption is automatically reduced to about 18Wh/H (* Note). The time to start this function can be set in the range of 2 min to 120 min. When this function is operated, all the lamps except for the pre-heat lamp on the operation panel turn off. To return to the initial state, press the COPY button. 	5 min
Stream feeding.	Only models with SPF.	Set
Auto shut off setting	Used to set or cancel this function.	Set

*Note: The power consumption values in pre-heat and auto shut off may be varied depending on the use conditions.

Change the setting.

Example: Changing the time to operate the auto shut off function (Change from 60 sec to 90 sec)

1. Press the right and the left exposure adjustment keys simultaneously to start setting.

- Keep pressing the keys for five sec.
- Display lamps (, ,  blink simultaneously and “-” is displayed on the copy quantity display.

2. Select the function code with the 10-digit key (copy quantity set key).

- The number of the selected function blinks on the digit of 10 on the copy quantity display.
- For auto clear, select “1.”
- For setting, refer to the following function codes.

Function name	Function code
Auto clear	1
Pre-heat	2
Auto shut off passing time	3
Stream feeding	4*
Auto shut off setting	5

[Cancel] If a wrong code is entered, press the clear key and enter the correct function code.

* SPF only

3. Press the COPY button.

- The number blinking on the digit of 10 of the copy quantity display is lighted.
- The number of the current set code blinks on the digit of 1.

4. Select the setting code with 1-digit key (copy quantity set key).

- To set to 90 sec, select “3.”
- For setting, refer to the following set codes.

Function name	Set code	Function name	Set code	Function name	Set code	Function name	Set code	Function name	Set code
Auto clear	0 (Cancel)	Pre-heat	0 (30 sec)	Auto shut off	0 (2 min)	Stream feeding	0 (Cancel)	Auto shut off setting	0 (Cancel)
	1 (30 sec)		1 (60 sec)		*1 (5 min)		*1 (Setting)		*1 (Setting)
	*2 (60 sec)		2 (90 sec)		2 (15 min)				
	3 (90 sec)				3 (30 min)				
	4 (120 sec)				4 (60 min)				
					5 (120 min)				

* : Factory setting

- The number of the selected set code blinks on the digit of 1 of the copy quantity display.




[Cancel] When a wrong number of the function code is set, press the clear key and perform the procedure again from 2.

5. Press the COPY button.

- The number blinking on the digit of 1 of the copy quantity display is lighted up. This means the setting is completed.

[Note] To set another function, press the clear key after completion of this operation and perform the procedure from 2.

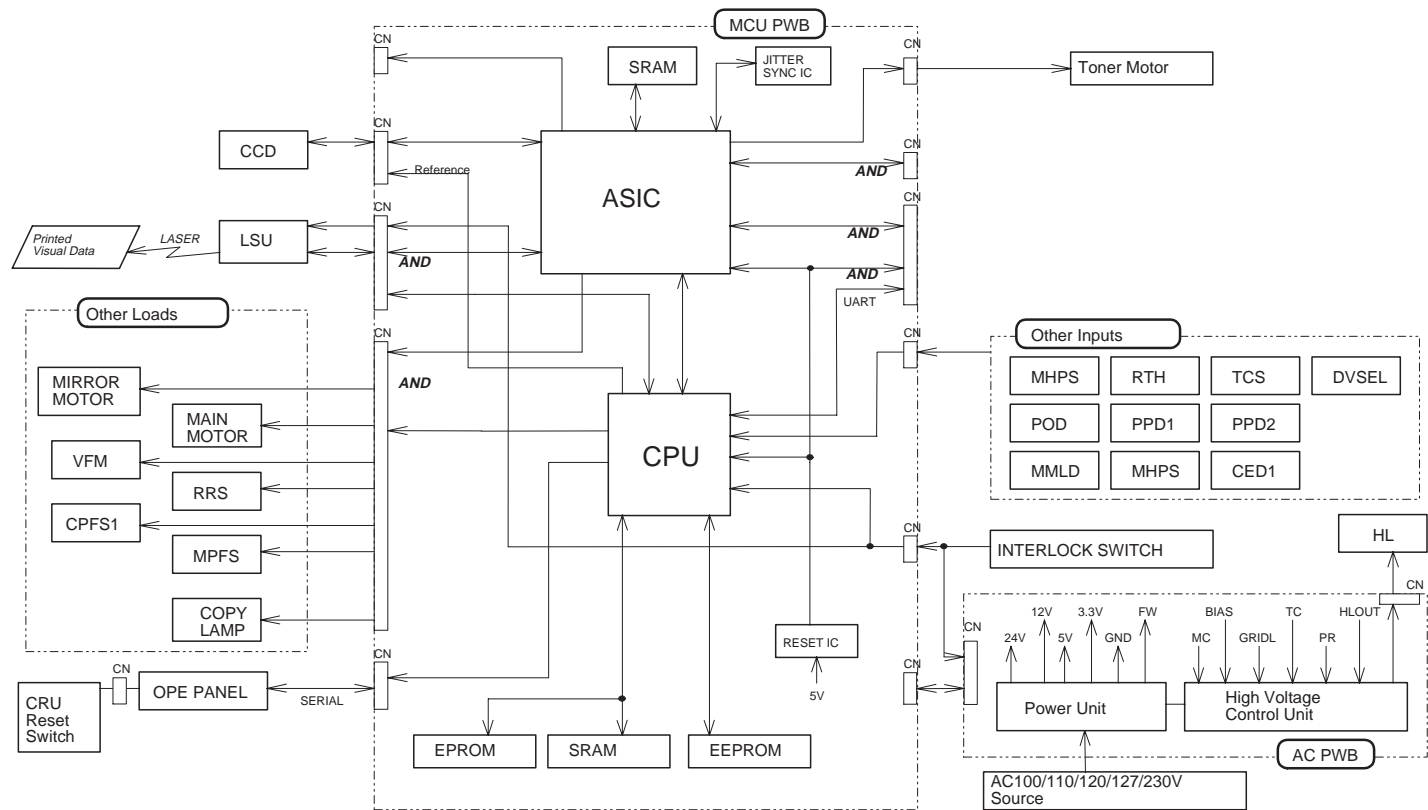
6. Press either one of exposure adjustment keys (or) to complete the setting.

- Display lamps (, , ) go off and the copy quantity display returns to the normal state.

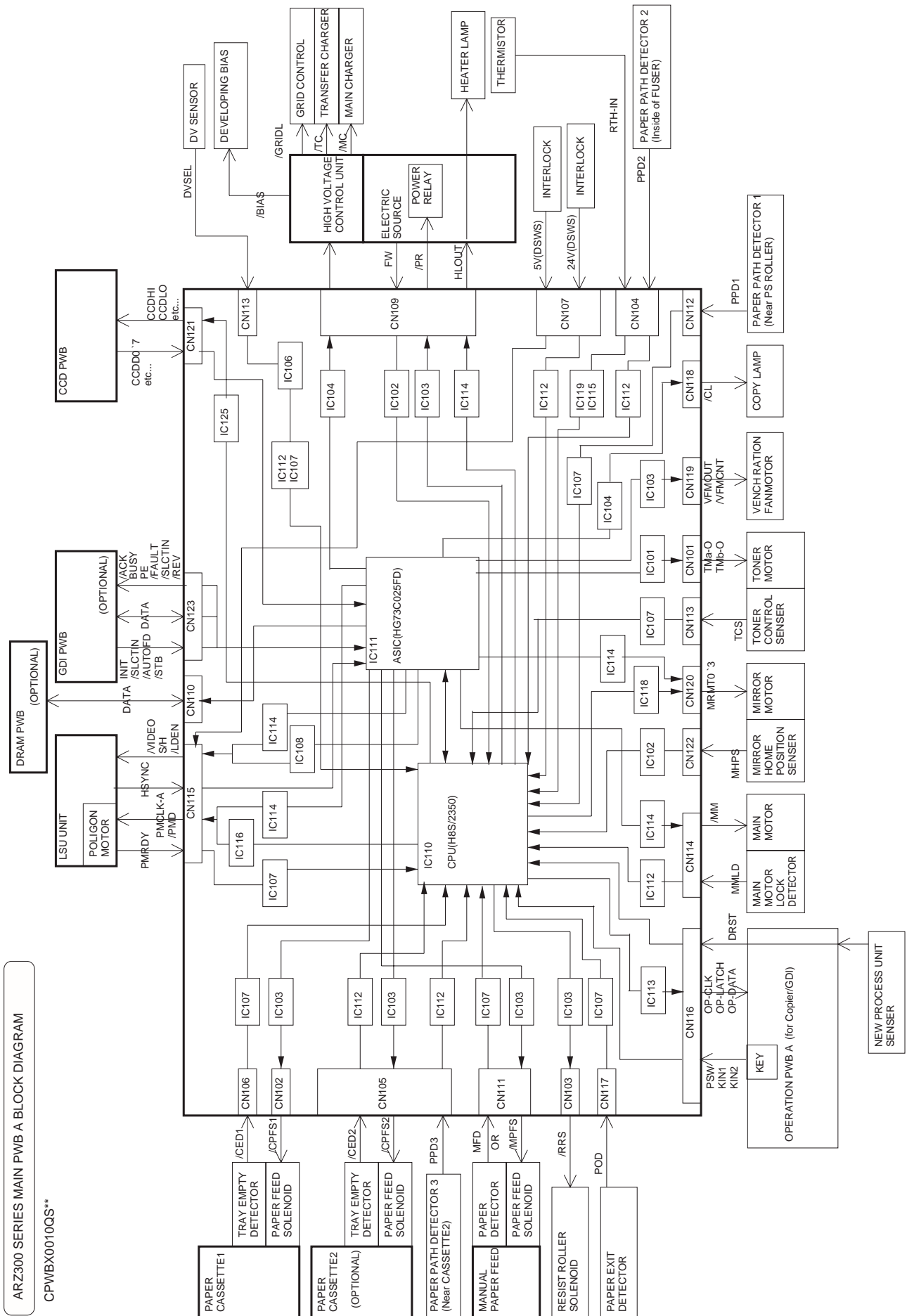
[12] ELECTRICAL SECTION

1. Block diagram

A. Overall block diagram



B. Main PWB block diagram (Load drive block diagram)



2. Circuit descriptions

A. Main PWB (MCU)

(1) CPU signal table

CPU pin table

Model without SPF

PIN No	Signal code	Input/output	Operating
1	/CS1	Output	Chip Select for SRAM
2	/CS0	Output	Chip Select for EPROM
3			D-GND
4			D-GND
5			5V
6	A0	Output	Address Bus (NC-pull up)
7	A1	Output	Address Bus
8	A2	Output	Address Bus
9	A3	Output	Address Bus
10		Output	D-GND
11	A4	Output	Address Bus
12	A5	Output	Address Bus
13	A6	Output	Address Bus
14	A7	Output	Address Bus
15	A8	Output	Address Bus
16	A9	Output	Address Bus
17	A10	Output	Address Bus
18	A11	Output	Address Bus
19		Output	D-GND
20	A12	Output	Address Bus
21	A13	Output	Address Bus
22	A14	Output	Address Bus
23	A15	Output	Address Bus
24	A16	Output	Address Bus
25	A17	Output	Address Bus (for 2Mbit EPROM) - (NC)
26	A18	Output	Address Bus (NC-pull up)
27	A19	Output	Address Bus (NC-pull up)
28			D-GND
29	A20	Output	Address Bus (NC-pull up)
30			NC-pull up
31			NC-pull up
32		(Interruption input)	NC-pull up
33	(MHPS)	Interruption level input	Mirror Home Position Sensor
34	/CPUSYNC	Interruption level input	Horizontal Synchronous (from G/A)
35			D-GND
36			D-GND
37	ZC	Interruption level input	Zero-cross signal
38	/ASICINT	Interruption level input	Interrupt from G/A
39			5V
40	D0	Data input/output	Data Bus
41	D1	Data input/output	Data Bus
42	D2	Data input/output	Data Bus
43	D3	Data input/output	Data Bus
44			D-GND

PIN No	Signal code	Input/output	Operating
45	D4	Data input/output	Data Bus
46	D5	Data input/output	Data Bus
47	D6	Data input/output	Data Bus
48	D7	Data input/output	Data Bus
49	D8	Data input/output	Data Bus
50	D9	Data input/output	Data Bus
51	D10	Data input/output	Data Bus
52	D11	Data input/output	Data Bus
53			D-GND
54	D12	Data input/output	Data Bus
55	D13	Data input/output	Data Bus
56	D14	Data input/output	Data Bus
57	D15	Data input/output	Data Bus
58			5V
59	(OP-DATA)	Output	Data Signal for Operation Panel
60			NC-pull up
61			NC-pull up
62			NC-pull up
63	(OP-CLK)	Output	Clock for Operation Panel
64	/PWOFF	Output	Power Off
65			D-GND
66			NC-pull up
67			D-GND
68			D-GND
69	PSW	Input	Print switch input
70	KIN1	Input	Key input 1
71	KIN2	Input	Key input 2
72	TMCLK	Timer output	Clock for Toner Motor
73	/TMEN	Output	On-Off Control for Toner Motor
74			NC-pull up
75	PMCLK	Timer output	Clock for Polygon Motor
76	/PRSTART	Output	Printing Start Signal
77	/SCANSP	Output	Scanning Stop Signal
78	/SCANST	Output	Scanning Start Signal
79	HL	OutputüTimer outputüj	On-Off Control for Heater Lamp
80	WDTOVF-	Output	Watchdog Timer
81	RES-	Input	Reset
82		Input	pull up
83		Input	pull up
84			5V
85	XTAL		Clock
86	EXTAL		Clock
87			D-GND
88	CPUCLK	Output	System Clock for G/A
89			5V
90	/AS	Output	pull up
91	/RD	Output	Read Signal
92	/HWR	Output	Write Signal (High Address)
93	/LWR	Output	Write Signal (Low Address)

PIN No	Signal code	Input/output	Operating
94	SELIN3	Output	Input select 3
95	SELIN2	Output	Input select 2
96	SELIN1	Output	Input select 1
97	PR	Output	Power relay control PR
98	RRS	Output	Resist roller solenoid RPC
99			D-GND
100			D-GND
101	SCLK	Output	Clock Line for EEPROM
102	SDA	Output	Data Line for EEPROM
103			A5V
104			Analog Reference Voltage-A5V
105	RTH	Analog input	Fusing Thirmister
106			
107	SIN1	Input	Sensor input 1
108	SIN2	Input	Sensor input 2
109	SIN3	Input	(Not used)
110	SIN4	Input	(Not used)
111	DAH	Analog output	Reference Voltage (High) for CCD
112	DAL	Analog output	Reference Voltage (Low) for CCD
113			AN-GND
114			D-GND
115			NC-pull up
116			NC-pull up
117			NC-pull up
118			NC-pull up
119	MRMT3	Motor output	Mirror Motor Excitement
120	MRMT2	Motor output	Mirror Motor Excitement
121	MRMT1	Motor output	Mirror Motor Excitement
122	MRMT0	Motor output	Mirror Motor Excitement
123		Input	CPU MODE SET <MODE 4> - GND
124		Input	CPU MODE SET <MODE 4> - GND
125		Input	CPU MODE SET <MODE 4> - Vcc
126			NC-pull up
127	DRST	Input	Drum reset detection
128	/CS2	Output	Chip Select for ASIC

(2) ASIC

1. Outline

Fig. 4 shows the block diagram of the ASIC.

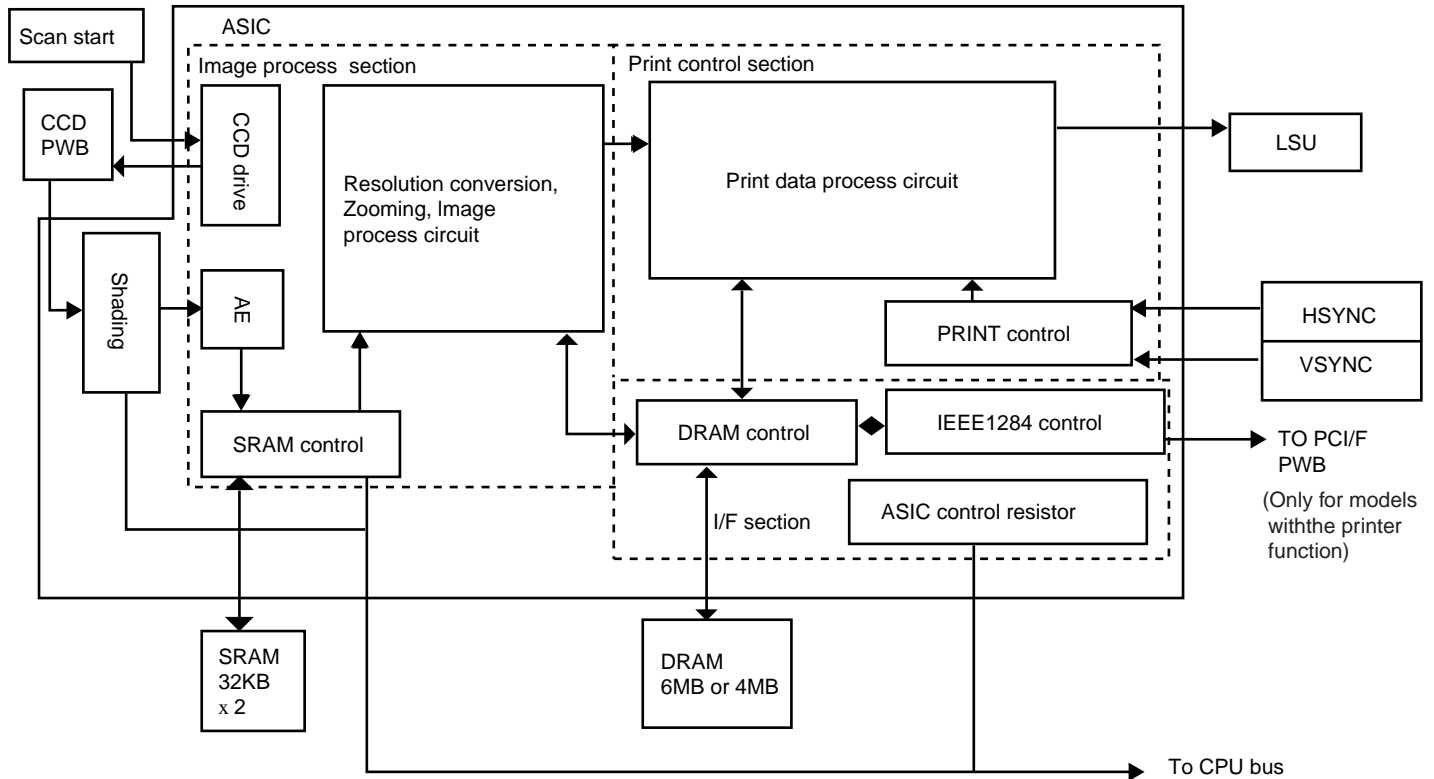
The ASIC is composed of the following three blocks; the image process section, the print control section, and the I/F section.

The image process section processes the image data from the CCD PWB according to the operation mode, such as shading, AE process, resolution conversion, and zooming.

The print control section outputs the image-processed data during copying to the LSU (Laser unit) in synchronization with writing timing of the LSU.

The I/F section controls communication of interface (IEEE1284) with the host PC and controls DRAM of send/receive data buffer with the host PC. (Only for models with the printer function)

The ASIC is controlled by the CPU which writes the operation mode and the set values necessary for each operation mode to the ASIC control register.



2. ASIC input/output

PIN No.	Signal name	IN/OUT	Connected to	Description
1	/SCANSPP	IN	CPU (I/O)	Scanner process interrupt signal
2	/PRSTART	IN	CPU	Print start trigger signal
3	TMON	IN	CPU	Toner motor ON/OFF
4	TMCLK	IN	CPU	Toner motor reference clock
5	3.3v	Power		
6	CPUAD7	IN	CPU	CPU address bus
7	CPUAD6	IN	CPU	CPU address bus
8	GND	Power		
9	CPUAD5	IN	CPU	CPU address bus
10	CPUAD4	IN	CPU	CPU address bus
11	CPUAD3	IN	CPU	CPU address bus
12	CPUAD2	IN	CPU	CPU address bus
13	CPUAD1	IN	CPU	CPU address bus
14	/CPUSYNC	OUT	CPU	Horizontal synchronization signal
15	/INTR	OUT	CPU	Interruption request signal
16	/CPUCS	IN	CPU	CPU chip select signal
17	/RESET	IN	RESET IC	Reset signal
18	5V	Power		
19	GND	Power		
20	3.3v	Power		
21	GND	Power		
22	MDATA15	IN/OUT	DRAM	Data bus of DRAM (page memory)
23	MDATA14	IN/OUT	DRAM	Data bus of DRAM (page memory)
24	MDATA13	IN/OUT	DRAM	Data bus of DRAM (page memory)
25	MDATA12	IN/OUT	DRAM	Data bus of DRAM (page memory)
26	MDATA11	IN/OUT	DRAM	Data bus of DRAM (page memory)
27	MDATA10	IN/OUT	DRAM	Data bus of DRAM (page memory)
28	MDATA9	IN/OUT	DRAM	Data bus of DRAM (page memory)
29	MDATA8	IN/OUT	DRAM	Data bus of DRAM (page memory)
30	MDATA7	IN/OUT	DRAM	Data bus of DRAM (page memory)
31	3.3v	Power		
32	MDATA6	IN/OUT	DRAM	Data bus of DRAM (page memory)
33	MDATA5	IN/OUT	DRAM	Data bus of DRAM (page memory)
34	GND	Power		
35	MDATA4	IN/OUT	DRAM	Data bus of DRAM (page memory)
36	MDATA3	IN/OUT	DRAM	Data bus of DRAM (page memory)
37	MDATA2	IN/OUT	DRAM	Data bus of DRAM (page memory)
38	MDATA1	IN/OUT	DRAM	Data bus of DRAM (page memory)
39	MDATA0	IN/OUT	DRAM	Data bus of DRAM (page memory)
40	/RAS0	OUT	DRAM	RAS signal 0 of DRAM (page memory)
41	/RAS1	OUT	DRAM	RAS signal 1 of DRAM (page memory)
42	/RAS2	OUT	DRAM	RAS signal 2 of DRAM (page memory)
43	/RAS64	OUT	DRAM	(Not used)
44	3.3V	Power		
45	/RAS16	OUT	DRAM	(Not used)
46	MAD0	OUT	DRAM	Address bus of DRAM (page memory)
47	GND	Power		
48	MAD1	OUT	DRAM	Address bus of DRAM (page memory)

PIN No.	Signal name	IN/OUT	Connected to	Description
49	MAD2	OUT	DRAM	Address bus of DRAM (page memory)
50	MAD3	OUT	DRAM	Address bus of DRAM (page memory)
51	MAD4	OUT	DRAM	Address bus of DRAM (page memory)
52	MAD5	OUT	DRAM	Address bus of DRAM (page memory)
53	MAD6	OUT	DRAM	Address bus of DRAM (page memory)
54	MAD7	OUT	DRAM	Address bus of DRAM (page memory)
55	MAD8	OUT	DRAM	Address bus of DRAM (page memory)
56	MAD9	OUT	DRAM	Address bus of DRAM (page memory)
57	3.3V	Power		
58	MAD10	OUT	DRAM	Address bus of DRAM (page memory)
59	MAD11	OUT	DRAM	Address bus of DRAM (page memory)
60	GND	Power		
61	/CAS0	OUT	DRAM	CAS signal of DRAM (page memory)
62	/CAS1	OUT	DRAM	CAS signal of DRAM (page memory)
63	/OE	OUT	DRAM	Read enable signal of DRAM (page memory)
64	/WE	OUT	DRAM	Write enable signal of DRAM (page memory)
65	OUTD0	OUT	Additional board	(Not used)
66	OUTD1	OUT	Additional board	(Not used)
67	OUTD2	OUT	Additional board	(Not used)
68	OUTD3	OUT	Additional board	(Not used)
69	3.3V	Power		
70	OUTD4	OUT	Additional board	(Not used)
71	OUTD5	OUT	Additional board	(Not used)
72	GND	Power		
73	OUTD6	OUT	Additional board	(Not used)
74	OUTD7	OUT	Additional board	(Not used)
75	OUTD8	OUT	Additional board	(Not used)
76	OUTD9	OUT	Additional board	(Not used)
77	OUTD11	OUT	Additional board	(Not used)
78	OUTD10	OUT	Additional board	(Not used)
79	OUTD12	OUT	Additional board	(Not used)
80	OUTD13	OUT	Additional board	(Not used)
81	OUTD14	OUT	Additional board	(Not used)
82	OUTD15	OUT	Additional board	(Not used)
83	/HSYNC	OUT	FAX board	(Not used)
84	/PCLPRD	IN	PCL board	(Not used)
85	/PCLREQ	OUT	PCL board	(Not used)
86	/PCLACK	IN	PCL board	(Not used)
87	/PCLCS	IN	PCL board	(Not used)
88	3.3V	Power		
89	GND	Power		
90	5V	Power		
91	GND	Power		
92	/FAXPRD	IN	FAX board	(Not used)
93	/FAXREQ	OUT	FAX board	(Not used)
94	/FAXACK	IN	FAX board	(Not used)
95	3.3V	Power		
96	/FAXCS	IN	FAX board	(Not used)

PIN No.	Signal name	IN/OUT	Connected to	Description
97	/ESPRD	IN	Electronic sort board	(Not used)
98	GND	Power		
99	/ESREQ	OUT	Electronic sort board	(Not used)
100	/ESACK	IN	Electronic sort board	(Not used)
101	/ESCS	IN	Electronic sort board	(Not used)
102	PARAD0	IN/OUT	1284CN board	(Not used)
103	PARAD1	IN/OUT	1284CN board	(Not used)
104	PARAD2	IN/OUT	1284CN board	(Not used)
105	PARAD3	IN/OUT	1284CN board	(Not used)
106	PARAD4	IN/OUT	1284CN board	(Not used)
107	PARAD5	IN/OUT	1284CN board	(Not used)
108	5V	Power		
109	PARAD6	IN/OUT	1284CN board	(Not used)
110	PARAD7	IN/OUT	1284CN board	(Not used)
111	GND	Power		
112	/REV	OUT	1284CN board	(Not used)
113	INIT	IN	1284CN board	(Not used)
114	/SLCTIN	IN	1284CN board	(Not used)
115	/AUTOFD	IN	1284CN board	(Not used)
116	/STB	IN	1284CN board	(Not used)
117	/ACK	OUT	1284CN board	(Not used)
118	BUSY	OUT	1284CN board	(Not used)
119	PE	OUT	1284CN board	(Not used)
120	/FAULT	OUT	1284CN board	(Not used)
121	5V	Power		
122	SLCT	OUT	1284CN board	(Not used)
123	/TESTPIN0	IN	TEST PIN	High: Normal Low: Test
124	GND	Power		
125	PFCLK	IN	Transmitter	Write clock
126	/TESTPIN1	IN	TEST PIN	High: Normal Low: Test
127	/SYNCEN	OUT	JITTER ADJUSTMENT IC	Jitter adjustment IC trigger signal
128	SD10	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
129	SD11	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
130	SD12	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
131	SD13	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
132	SD14	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
133	5V	Power		
134	SD15	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
135	SD16	IN/OUT	SRAM (separation)	Data line to SRAM before are separation

PIN No.	Signal name	IN/OUT	Connected to	Description
136	GND	Power		
137	SD17	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
138	SOE1	OUT	SRAM (separation)	Read enable line to SRAM before area separation
139	SWE1	OUT	SRAM (separation)	Write enable line to SRAM before area separation
140	SCS1	OUT	SRAM (separation)	Chip select line to SRAM before area separation
141	SOE0	OUT	SRAM (separation)	Read enable line to SRAM before area separation
142	SWE0	OUT	SRAM (separation)	Write enable line to SRAM before area separation
143	SCS0	OUT	SRAM (separation)	Chip select line to SRAM before area separation
144	SD00	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
145	SD01	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
146	5V	Power		
147	SD02	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
148	SD03	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
149	GND	Power		
150	SD04	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
151	SD05	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
152	SD06	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
153	SD07	IN/OUT	SRAM (separation)	Data line to SRAM before are separation
154	SAD0	OUT	SRAM (separation)	Address line to SRAM before area separation
155	SAD1	OUT	SRAM (separation)	Address line to SRAM before area separation
156	SAD2	OUT	SRAM (separation)	Address line to SRAM before area separation
157	SAD3	OUT	SRAM (separation)	Address line to SRAM before area separation
158	SAD4	OUT	SRAM (separation)	Address line to SRAM before area separation
159	SAD5	OUT	SRAM (separation)	Address line to SRAM before area separation
160	SAD6	OUT	SRAM (separation)	Address line to SRAM before area separation
161	SAD7	OUT	SRAM (separation)	Address line to SRAM before area separation
162	GND	Power		
163	SAD8	OUT	SRAM (separation)	Address line to SRAM before area separation
164	SAD9	OUT	SRAM (separation)	Address line to SRAM before area separation

PIN No.	Signal name	IN/OUT	Connected to	Description
165	SAD10	OUT	SRAM (separation)	Address line to SRAM before area separation
166	SAD11	OUT	SRAM (separation)	Address line to SRAM before area separation
167	SAD12	OUT	SRAM (separation)	Address line to SRAM before area separation
168	SAD13	OUT	SRAM (separation)	Address line to SRAM before area separation
169	/f1	OUT	CCD PWB	CCD drive signal transfer clock (First phase)
170	/f2	OUT	CCD PWB	CCD drive signal transfer clock (Second phase)
171	/SH	OUT	CCD PWB	CCD drive signal shift pulse
172	5V	Power		
173	RS	OUT	CCD PWB	CCD drive signal reset pulse
174	SP	OUT	CCD PWB	CCD drive signal sampling hold pulse
175	GND	Power		
176	CP	OUT	CCD PWB	A/D conversion IC latch clock
177	BCLK	OUT	CCD PWB	CCD shield output latch signal
178	IDIN0	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
179	IDIN1	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
180	IDIN2	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
181	IDIN3	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
182	IDIN4	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
183	IDIN5	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
184	IDIN6	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
185	5V	Power		
186	IDIN7	IN	CCD PWB (AD conversion)	Image scan data (after 8bit A/D conversion)
187	/SDCLK	OUT	CHECK	Effective image area signal
188	GND	Power		
189	SFCLK	IN	Transmitter	CCD drive clock (48MHz), Also used as an internal clock.
190	TEST port 0	IN	AUTO SCAN TEST	High: Normal Low: Test
191	/SYNC	IN	LSU	Horizontal synchronization signal (HSYNC) from LSU
192	/LD	OUT	LSU	Laser drive signal
193	/LEND	OUT	LSU	Laser APC signal
194	PORTOUT28	OUT		(Not used)
195	PORTOUT27	OUT		(Not used)
196	PORTOUT26	OUT		(Not used)
197	3.3V	Power		
198	PORTOUT25	OUT		(Not used)
199	PORTOUT24	OUT		(Not used)
200	GND	Power		
201	PORTOUT23	OUT		(Not used)
202	PORTOUT22	OUT		(Not used)
203	PORTOUT21	OUT		(Not used)

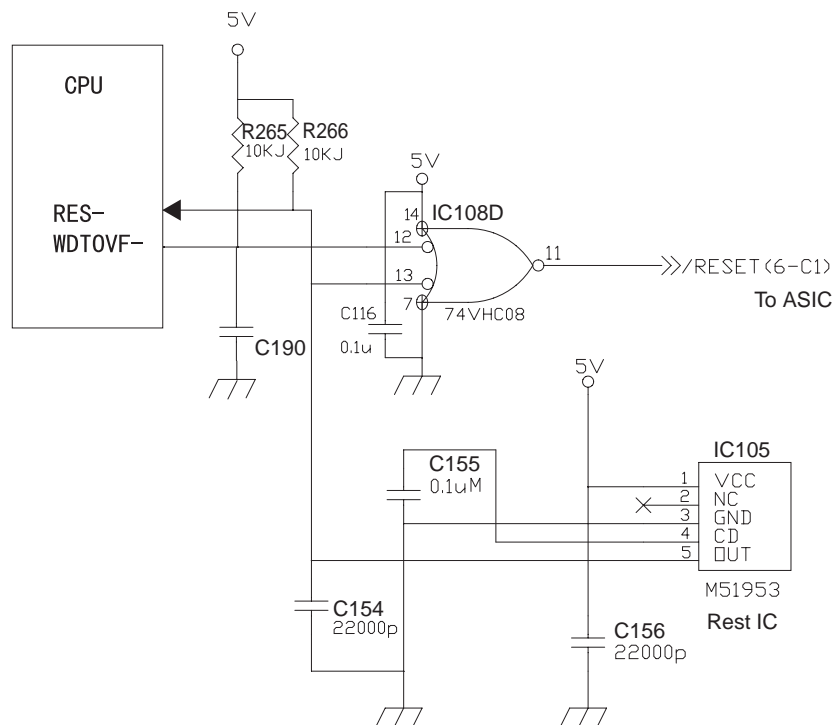
PIN No.	Signal name	IN/OUT	Connected to	Description
204	PORTOUT20	OUT		(Not used)
205	OP-LATCH	OUT	Tr array IC	Latch signal for operation circuit. Data latch at LOW.
206	MRPS2	OUT	Tr array IC	Mirror speed control signal. Mirror speed 2 at LOW.
207	MRPS1	OUT	Tr array IC	Mirror speed control signal. Mirror speed 1 at LOW.
208	PORTOUT16	OUT		(Not used)
209	PORTOUT15	OUT		(Not used)
210	3.3V	Power		
211	TC	OUT	Tr array IC	Transfer charger control signal. ON at HIGH.
212	GRIDL	OUT	Tr array IC	Main charger grid control signal. ON at HIGH.
213	GND	Power		
214	MC	OUT	Tr array IC	Main charger control signal. ON at HIGH.
215	BIASL	OUT	Tr array IC	DV bias voltage control signal. ON at HIGH.
216	BIASH	OUT	Tr array IC	DV bias voltage control signal. ON at HIGH.
217	BIAS	OUT	Tr array IC	DV bias output control signal. ON at HIGH.
218	CL	OUT	Tr array IC	Copy lamp control signal. ON at HIGH.
219	VFMCNT	OUT	Tr array IC	Ventilation fan rotating speed control signal. Low speed at HIGH, high speed at LOW.
220	VFM	OUT	Tr array IC	Ventilation fan control signal. Fan ON at HIGH.
221	LDEN	OUT	Tr array IC	Laser circuit control signal. Laser circuit ON at HIGH.
222	PMD	OUT	Tr array IC	Polygon motor control signal. Polygon motor ON at HIGH.
223	5V	Power		
224	MM	OUT	Tr array IC	Main motor control signal. Main motor ON at HIGH.
225	MPFS	OUT	Tr array IC	Manual paper feed solenoid control signal. Multi paper feed ON at HIGH.
226	GND	Power		
227	CPFS2	OUT	Tr array IC	Second cassette paper feed solenoid control signal. Second cassette paper feed at HIGH.
228	CPFS1	OUT	Tr array IC	Cassette paper feed solenoid control signal. One-stage cassette paper feed at HIGH.
229	TM	OUT	Tr array IC	Toner motor drive output (+)
230	TM_	OUT	Tr array IC	Toner motor drive output (-)
231	CPUD15	IN/OUT	CPU	CPU data bus
232	CPUD14	IN/OUT	CPU	CPU data bus
233	CPUD13	IN/OUT	CPU	CPU data bus
234	CPUD12	IN/OUT	CPU	CPU data bus
235	CPUD11	IN/OUT	CPU	CPU data bus
236	5V	Power		
237	CPUD10	IN/OUT	CPU	CPU data bus
238	CPUD9	IN/OUT	CPU	CPU data bus
239	GND	Power		
240	CPUD8	IN/OUT	CPU	CPU data bus
241	CPUD7	IN/OUT	CPU	CPU data bus
242	CPUD6	IN/OUT	CPU	CPU data bus
243	CPUD5	IN/OUT	CPU	CPU data bus
244	CPUD4	IN/OUT	CPU	CPU data bus
245	CPUD3	IN/OUT	CPU	CPU data bus
246	CPUD2	IN/OUT	CPU	CPU data bus
247	CPUD1	IN/OUT	CPU	CPU data bus
248	CPUD0	IN/OUT	CPU	CPU data bus
249	3.3V	Power		

PIN No.	Signal name	IN/OUT	Connected to	Description
250	/CPUWR	IN	CPU	CPU write signal
251	/CPURD	IN	CPU	CPU read signal
252	GND	Power		
253	CPUCLK	IN	CPU	CPU system clock
254	GND	Power		
255	TEST PORT1	IN	AUTO SCAN TEST	High: Normal Low: Test
256	/SCANST	IN	CPU (I/O)	Scanner process start signal

(3) Reset circuit

This circuit detects ON/OFF of power to control start/stop of each circuit. The 5V voltage of the main PWB is detected by the reset IC to generate the reset signal.

When the power voltage reaches the specified level, the circuit operations are started. Before the power voltage falls below the specified level, the circuit operations are stopped to prevent against malfunctions.

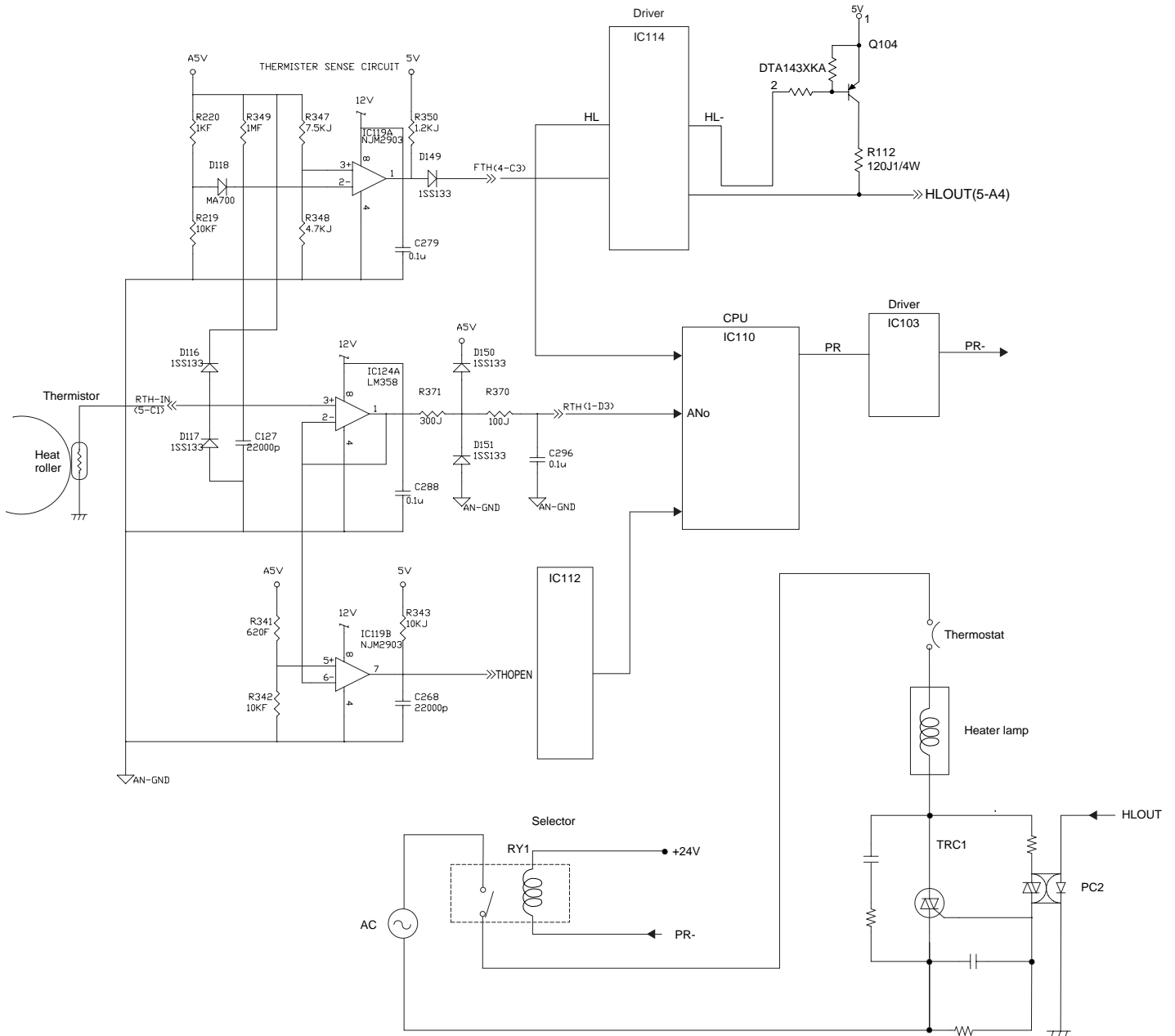


(4) Heater lamp control circuit

(1) Outline

The heater lamp control circuit detects the heat roller surface temperature and converts it into a voltage level, which is inputted to the CPU analog input pin.

The CPU converts the analog voltage into a digital signal level and compares it with the set value of the simulation to turn on/off the heater lamp according to the level, maintaining the heat roller surface temperature at a constant level.



The lower the heat roller surface temperature is, the greater the thermistor resistance is, and vice versa.

Therefore, the lower the heat roller surface temperature is, the higher the thermistor terminal voltage is, and vice versa. The thermistor terminal voltage is inputted to the CPU analog port. The CPU controls ON/OFF of the heater lamp by this input voltage level.

[High temperature protect circuit in case of CPU hung up]
For IC119 3pin (reference voltage), +5V is divided by the resistor.

The thermistor terminal voltage is inputted to IC119 2pin.

When, therefore, the voltage at 2pin becomes lower than the voltage at 3pin (when the heat roller temperature is about 220 C - 230°C), IC119 1pin becomes HIGH, and the HL signal is lowered to the GND level through IC114, stopping generation of the heater lamp ON signal. (IC119 1pin is normal LOW.)

[When the heat roller surface temperature is lower than the set level]

- Since the thermistor terminal voltage is higher than the set level, the HL signal from the CPU becomes HIGH.
- The HL signal is turned to be the HLOUT signal through IC114 protect circuit, and inputted to the photo triac coupler (PC2).
- When the internal triac turns on, a pulse is applied to the gate of the external triac. Consequently a current flow from the power source through the heater lamp to the triac, lighting the heater lamp.

[When the heat roller surface temperature is higher than the set level]

- Since the thermistor terminal voltage becomes lower than the set value, the HL signal from the CPU becomes LOW.
- The HL turns LOW, the PC2 turns OFF, the external triac turns OFF, and the heater lamp turns OFF.

[In case of the thermistor open]

The voltage at IC119 6pin over the voltage at 5pin to drive the output THOPEN at 7pin to LOW. This is passed through the selector to the CPU and the trouble code "H2" is displayed.

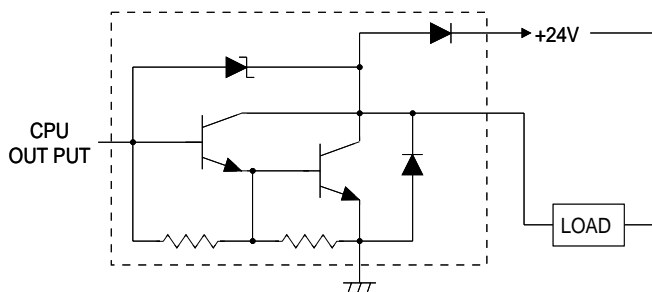
(5) Driver circuit (Solenoid)

(1) Outline

Since the control signal of each load outputted from the CPU cannot drive the load directly, it is passed through the driver IC to the load.

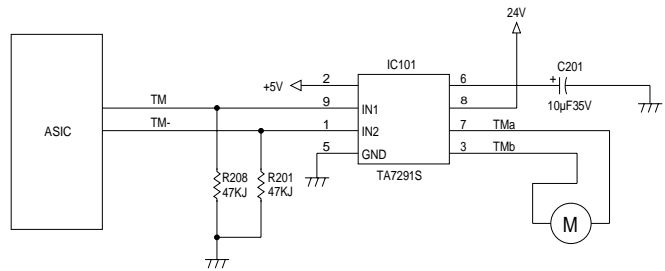
(2) Operation

The driver circuit forms a Darlington circuit with transistors. Therefore a large drive current is obtained from a small current (CPU output current). When the driver input voltage is HIGH (+5V), the transistor turns ON to flow a current in the arrow direction, operating the load. When the driver is ON, the driver output terminal voltage is 0V.

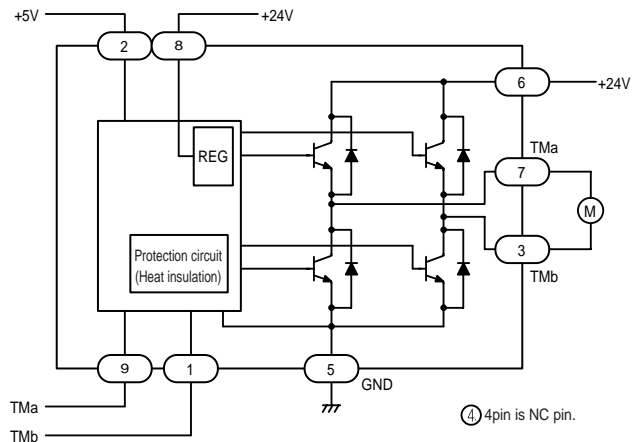


(6) Toner supply motor drive circuit

The IC101 is the motor control IC, which generates the pseudo AC waveform with the pulse signals (TM, TM-) outputted from ASIC, driving the toner supply motor.

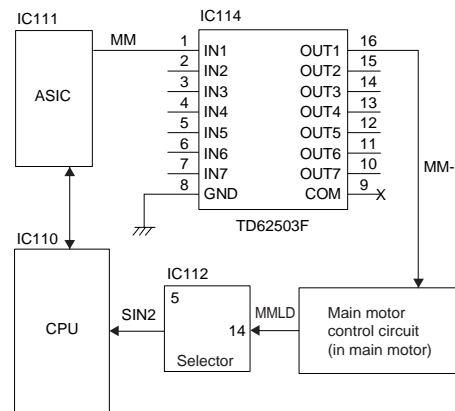


Internal circuit



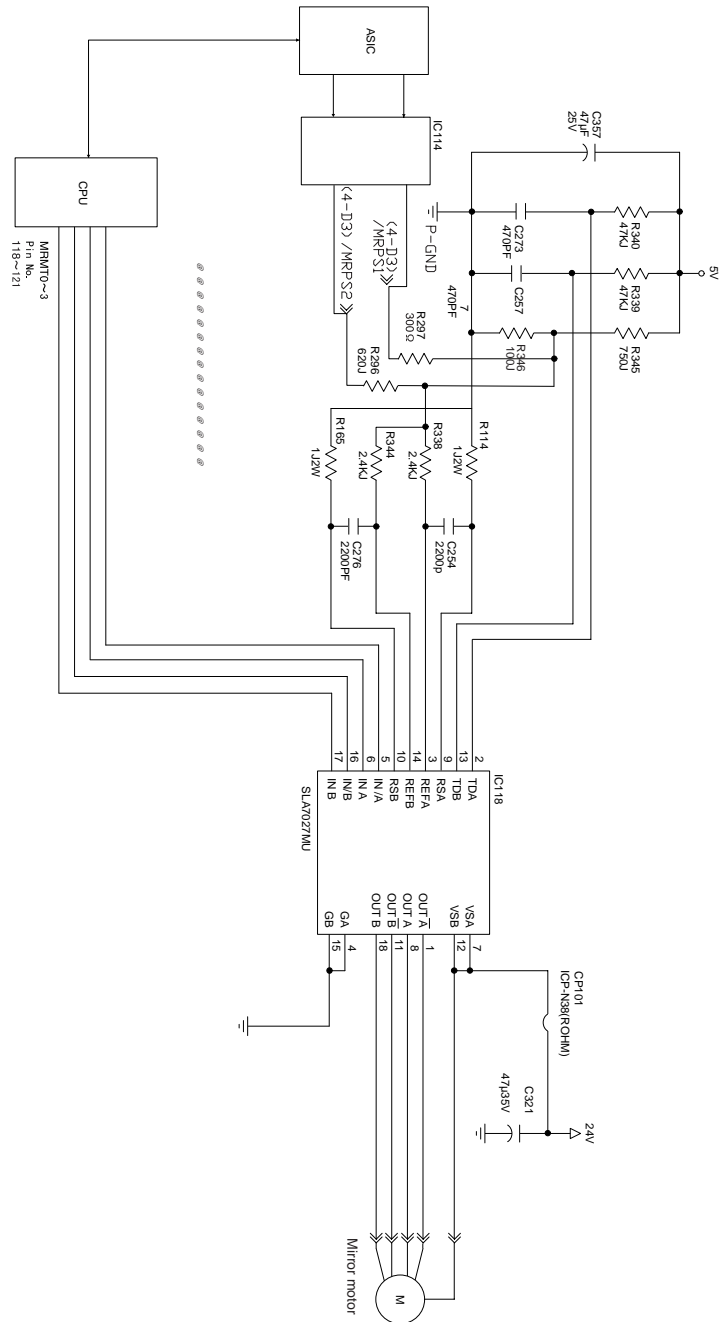
(7) Main motor drive circuit

The main motor is driven by the MM signal from ASIC. While the main motor is rotating, the MM signal is driven to HIGH and passed through IC114 to the control circuit in the main motor to rotate the main motor. The MMLD signal is kept HIGH until the main motor speed reaches the specified rpm, and passed through the selector to the CPU.



(8) Mirror motor circuit

The mirror motor is a stepping motor, and it uses the IC118 and the constant current chopper control IC (SLA7027). For control, the CPU outputs the drive signal to the IC118 to drive the mirror motor with 1-2 phase excitement.



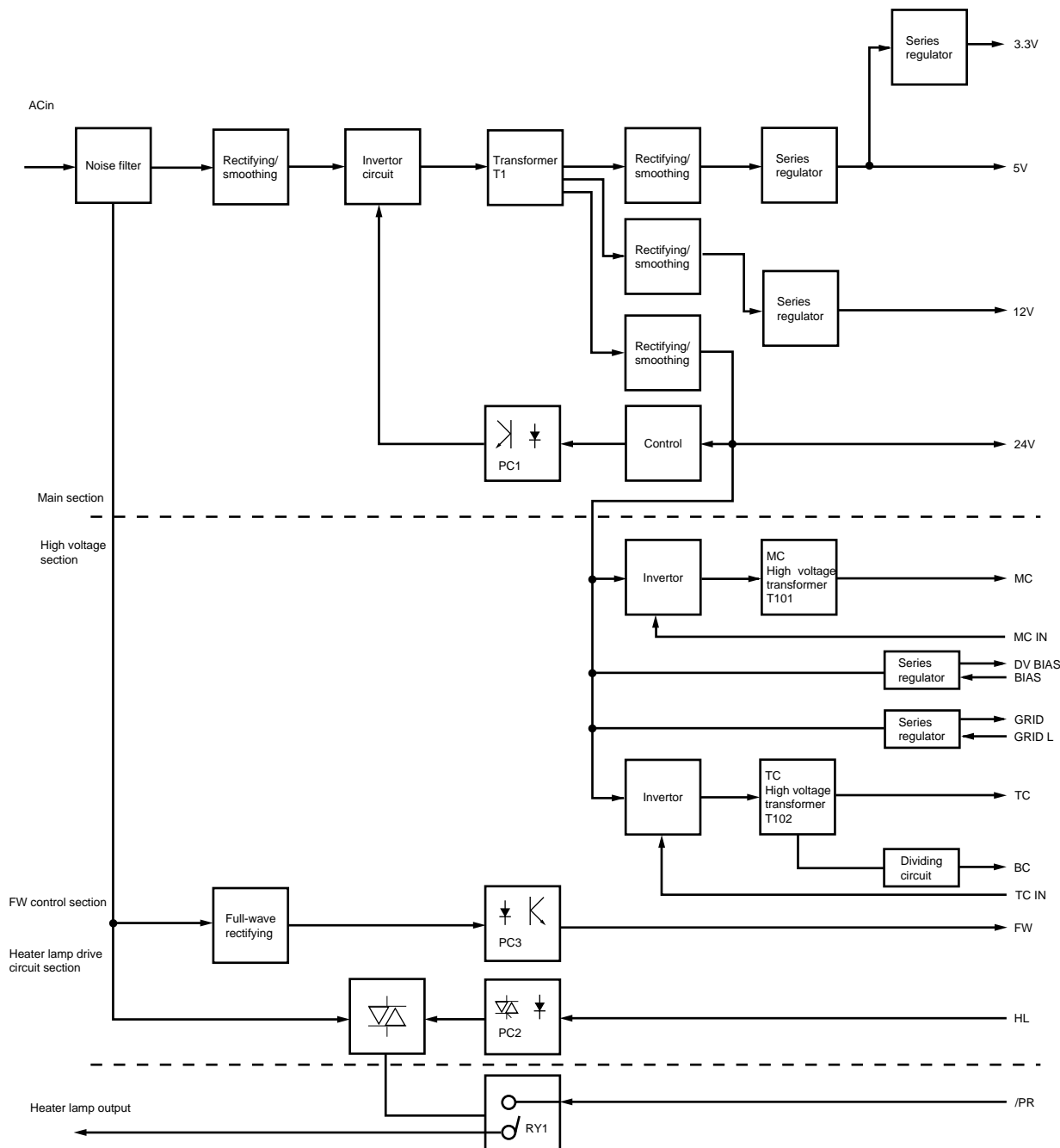
(9) Power circuit block diagram

Block diagram

The power circuit is composed of the main section, the high voltage circuit, the FW signal section, and the heater lamp drive circuit. The main section directly rectifies the AC power current and switch-converts with the DC/DC convertor, and rectifies again and smoothes to form each DC power.

In the high voltage circuit section, the 24V output of the main section is switch-converted by the DC/DC convertor and rectified and smoothed to form the high voltage output.

The FW signal section fullwave-rectifies the AC power to supply signal output at the timing of 0V.



Circuit descriptions

(1) Main section

a. Noise filter circuit

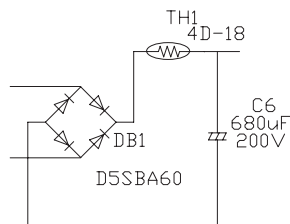
The noise filter circuit of the DC power is composed of L and C as shown in the figure below. It reduces normal mode noises and common mode noises which come from and go to the AC line.

The normal mode noises are noises which are generated in the AC line or the output line and are attenuated by C4B and C3. The common mode noises are noise voltages generated between the AC line and GND, and are attenuated by L1 and L2. The noise composition is bypassed to GND through C4 and C5.

b. Rectifying/smoothing circuit

The AC voltage of 50(60)Hz is full-wave rectified by the rectifying diode DB1 and smoothed by the smoothing capacitor C6.

TH1 is the power thermistor which limits a rush current flowing to C6.



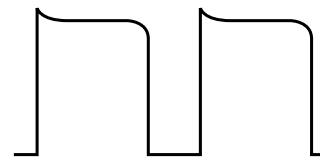
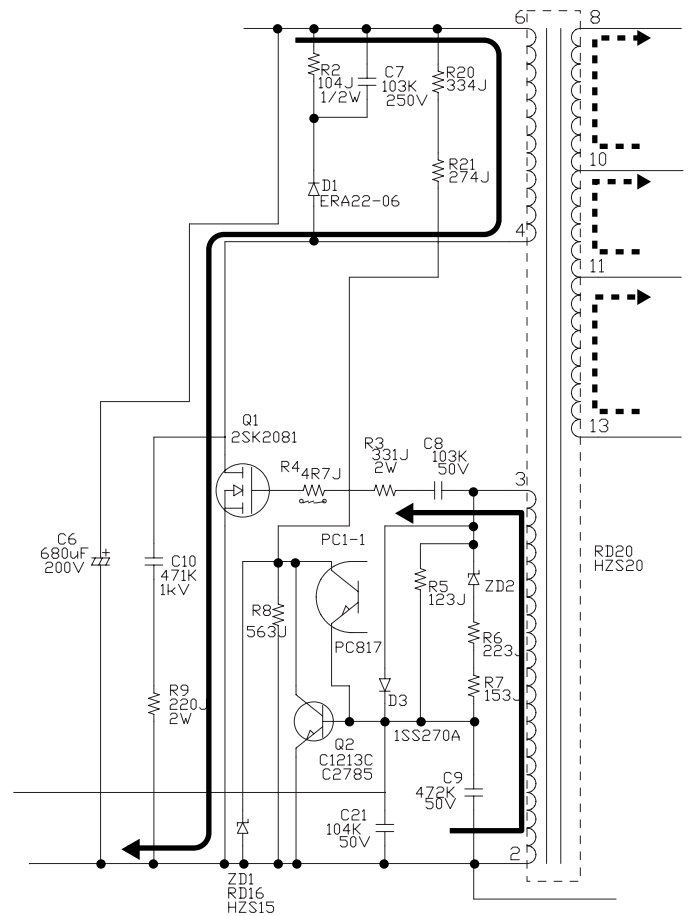
c. Invertor circuit

The DC voltage from the rectifying/smoothing circuit is supplied to the secondary side of transformer T1 by switching operation of FET Q1.

For switching, the RCC (Ringing Choke Converter) system is employed.

FET Q1 is turned on by the starting resistors R20 and R1 to generate a voltage between terminals 4 and 6 of transformer T1 and between terminals 2 and 3 simultaneously. Then a voltage is applied to the gate of FET Q1 to oscillate high frequency.

The actual line in the circuit diagram shows the current to turn ON FET Q1, and the dotted line shows the current loop through which the energy accumulated in the transformer is discharged when FET Q1 is turned OFF.



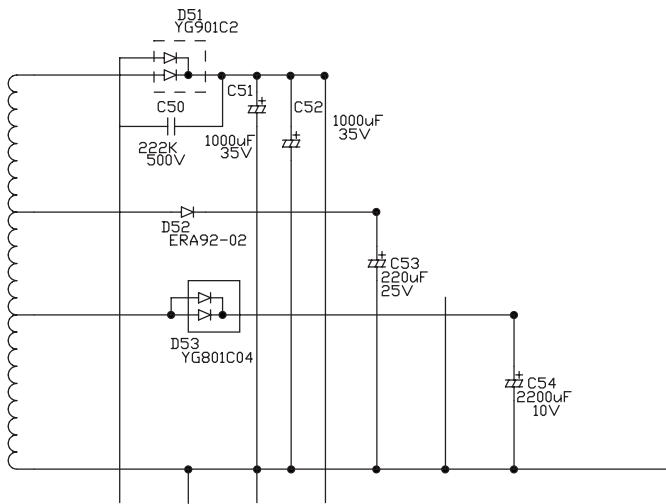
Voltage across Q1 drain and source (VDS)



Q1 drain current (ID)

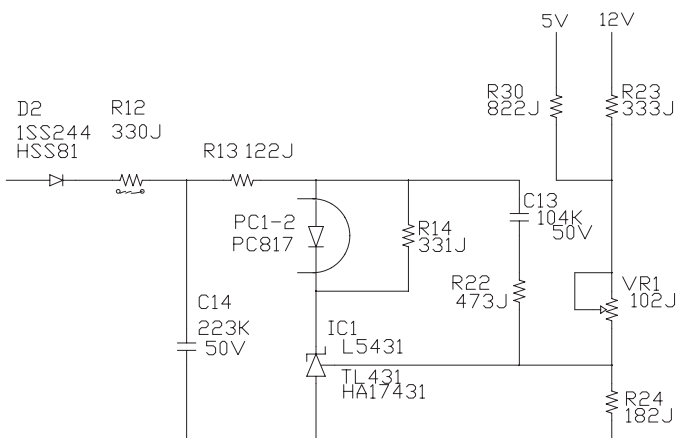
d. Rectifying/smoothing circuit on the secondary side

The high frequency pulse generated by the invertor circuit is dropped by transformer T1, rectified by diodes D51, D52, and D53, and smoothed by capacitors C51, C52, C53, and C54.



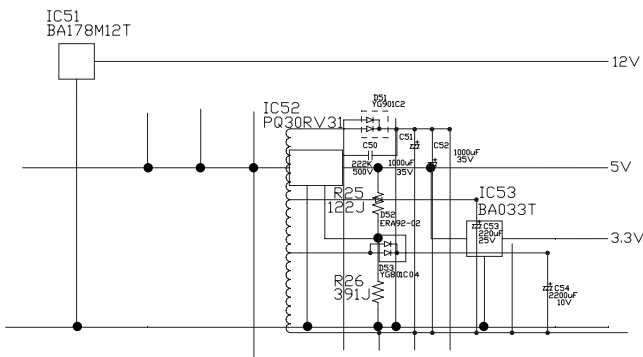
e. Control circuit

The secondary side outputs (24V series, 5V series) are detected by the output voltage detecting circuit, and the detected signal is fed-back through photo coupler PC1 to the control transistor Q2 to change the ON period of FET Q1 in the primary side inverter circuit, stabilizing the output voltage.



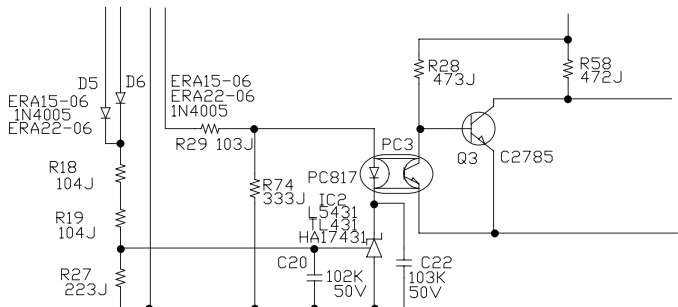
f. Series regulator circuit

This circuit stabilizes the output and protect against an overcurrent by the series regulator. The 12V is composed of IC51, the 5V is composed of IC52, the 3.3V is composed of IC53.

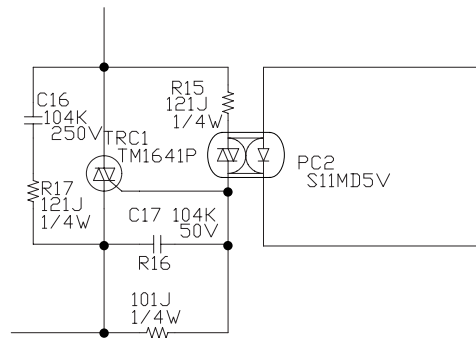


(2) FW signal

The AC input voltage is full-wave rectified by D5 and D6. When the voltage is divided by resistors R18, R19, and R27 and decreased below 2.5V, the shunt regulator IC7 is turned OFF to turn OFF photo coupler PC3, and turn ON transistor Q3. LOW level output of FW signal is provided.



(3) Heater lamp drive circuit



(4) High voltage section

a. Inverter circuit

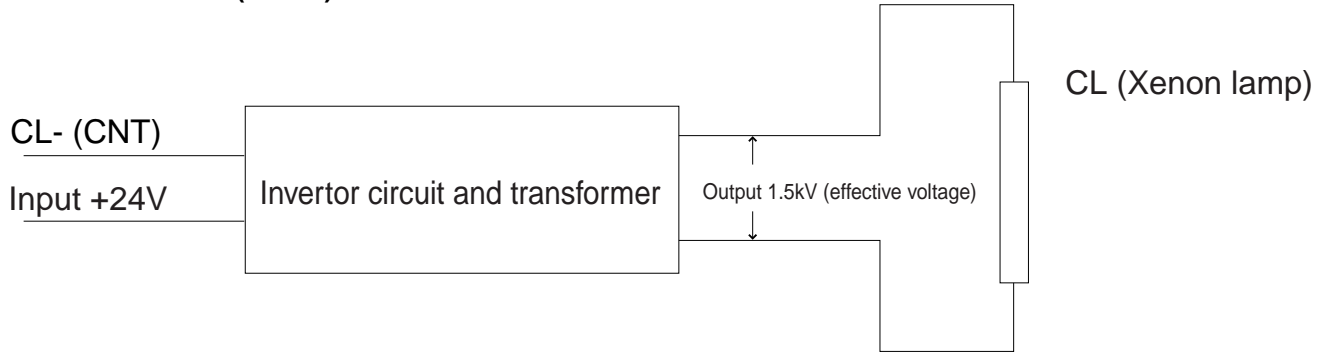
The 24V output of the main section is inverted by the RCC system and the high frequency power is supplied to the secondary side of high voltage transformer T101 and T102. The diode and the capacitor for rectifying and smoothing are built in the secondary side of high voltage transformer T101 and T102 to provide DC outputs of high voltage. MC is turned ON/OFF by MC IN terminal, and TC is turned ON/OFF by TC IN terminal.

b. Series regulator

The GRID output of DV BIAS is applied from the MC output and dropped by the series regulator. DV BIAS is turned ON/OFF by BIAS terminal, and the GRID voltage is switched by GRID L terminal.

c. Dividing circuit

BD OUT takes out a voltage from T102 and divides it with the resistor and outputs it.

(10) CI inverter PWB (circuit)**Circuit description**

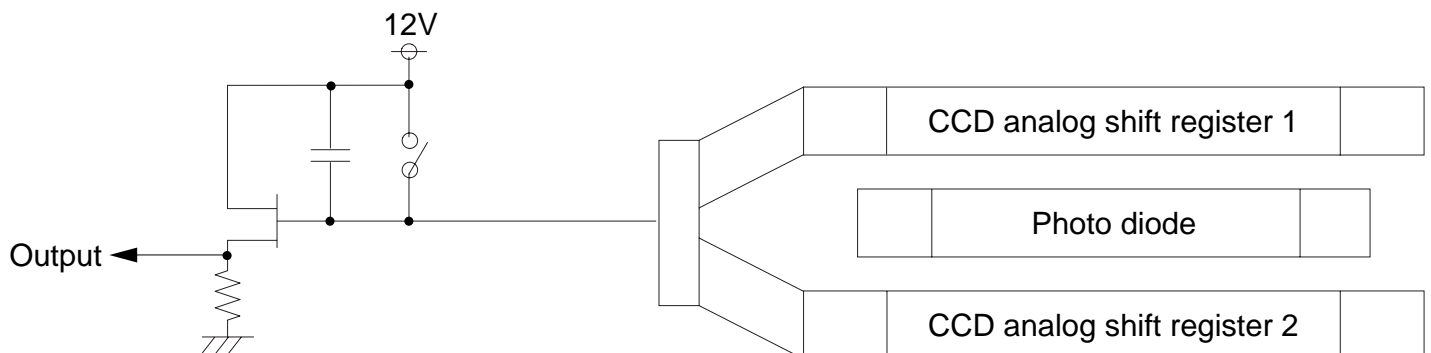
The Two transistors connected in series to the transformer are switched on/off by the control signal (CL-) from the MCU. By this switching operation, the signals are converted into switching pulses and a high frequency power is supplied to the CL (Xenon lamp) by the transformer.

(11) CCD PWB operational description

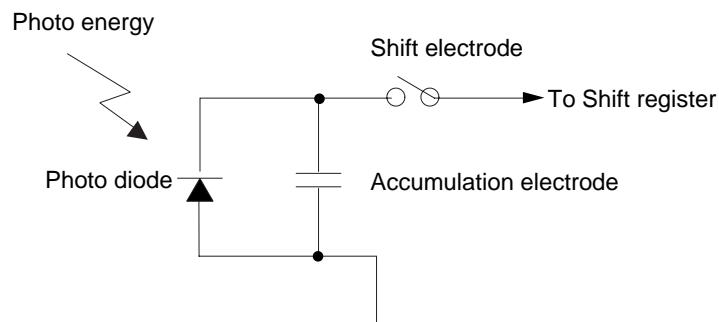
The CCD PWB is provided with the CCD (Charge-Coupled Device), the differential amplifier which amplifies CCD signals, and the AD convertor which converts the amplified signals into digital signals.

The DC power and the pulse supply pins necessary for operating the CCD image sensor are the power source (CD pin), GND (SS pin), shift pulse (SH pin), transfer pulse ($\phi 1$ pin), ($\phi 2$ pin), reset pulse (/RS pin), clamp pulse (/CP pin), and sampling (/SP pin). Photo data are stored in the light receiving element at the center of the CCD by the SH signal. Even number pixel data are sent to one of the two shift registers which are positioned at both ends of the light receiving element, and odd number pixel data are sent to the other shift register. The time interval between inputting two SH signals is called the photo accumulation time.

The signals are transferred to the register, then to the shift register sequentially by transfer pulses $\phi 1$ and $\phi 2$ and to the floating capacitor section where electric signals are voltage-converted. Electric charges from the even number pixel shift register and the odd number pixel shift register are flowed to the floating capacitor section alternatively.



The /RS signal is the reset signal of the CCD output signal. The CCD output is expressed as electric charges equivalently accumulated in the capacitor. Therefore, to take the CCD output data one pixel by one pixel, one output data must be cleared after it is outputted. The /RS signal is used for that operation.



The /SP pulse signal is the peak hold signal of the signal voltage.

The output signal from the CCD is amplified by about 4.7 times greater in the differential amplifier circuit in the CCD PWB. Differential amplification is made for the signal output (OS) and the compensation output (DOS).

The amplified CCD signal output is sent to the clamp circuit. In the clamp circuit, the black level is clamped to 2V at the BCLK signal timing by the analog switch. The clamped voltage is maintained for one line by the coupling capacitor. The clamped analog signal is impedance-converted and inputted to the AD convertor.

The analog signal inputted to the AD convertor is converted into 8bit digital data and passed to the PCU PWB.

The machine employs the TCD1501C as the image sensor. The TCD1501C is the reduction type high sensitivity CCD linear sensor of one-output system. 5000 pixels of 7 μ m x 7 μ m are arranged in line to allow scanning of A3 document at 400dpi (16 lines/mm).

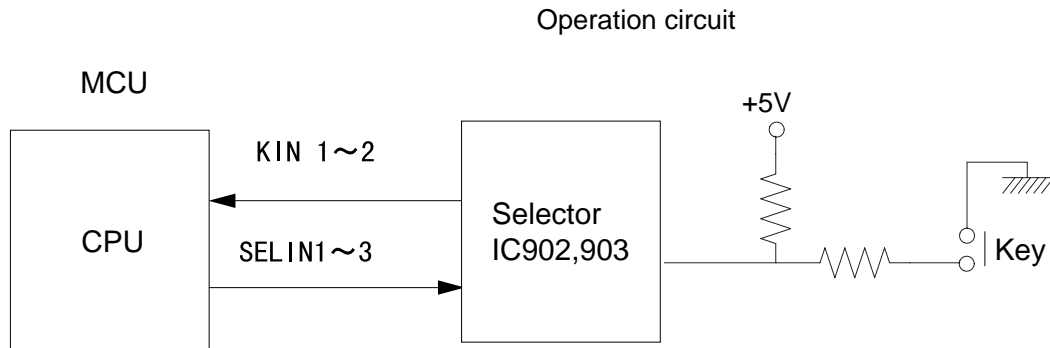
Operation section

(1) Outline

The operation circuit is composed of the key matrix circuit and the display matrix circuit.

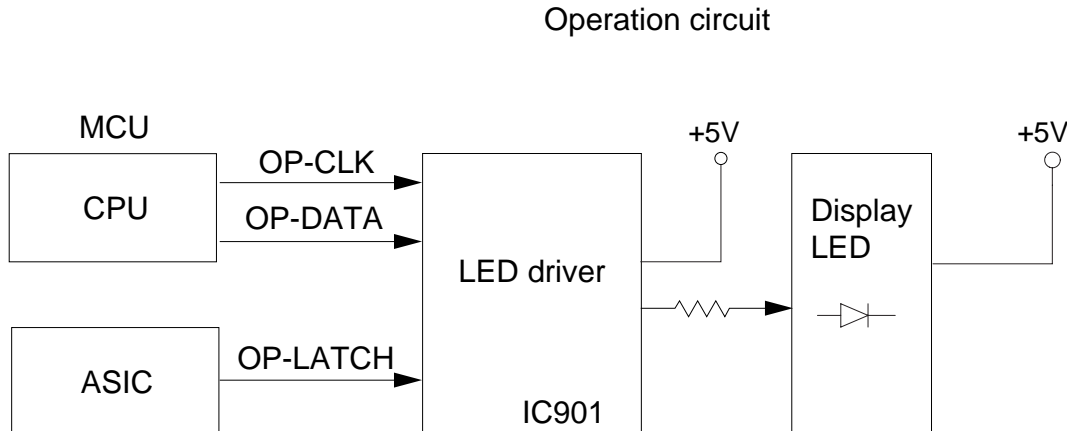
(2) Key matrix circuit

The CPU in the MCU sends select signals SELIN1 - 3 to the selector in the operation circuit. The signals detects ON/OFF of the key and are sent to the CPU as KIN1 - 2.

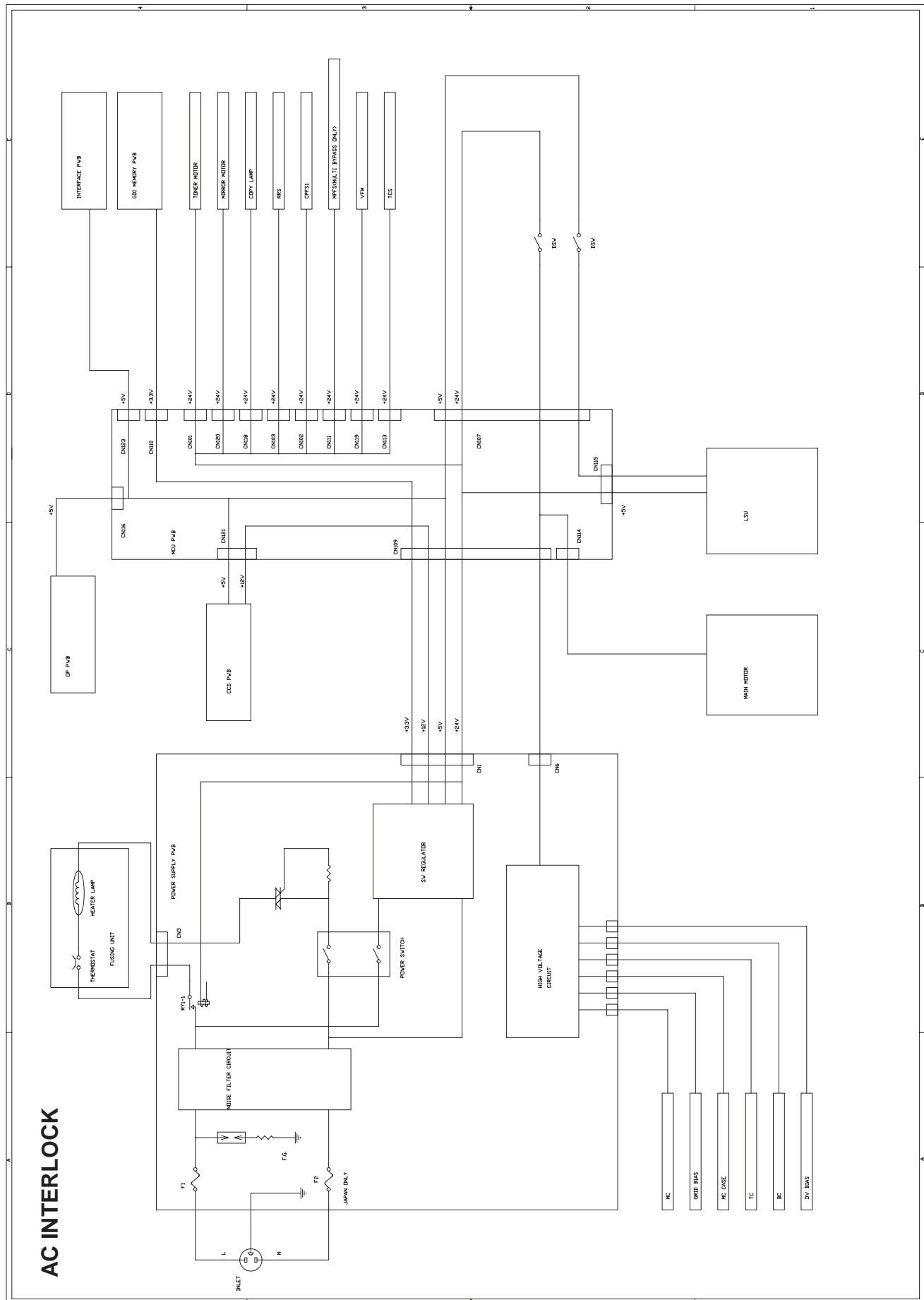


(3) Display circuit section

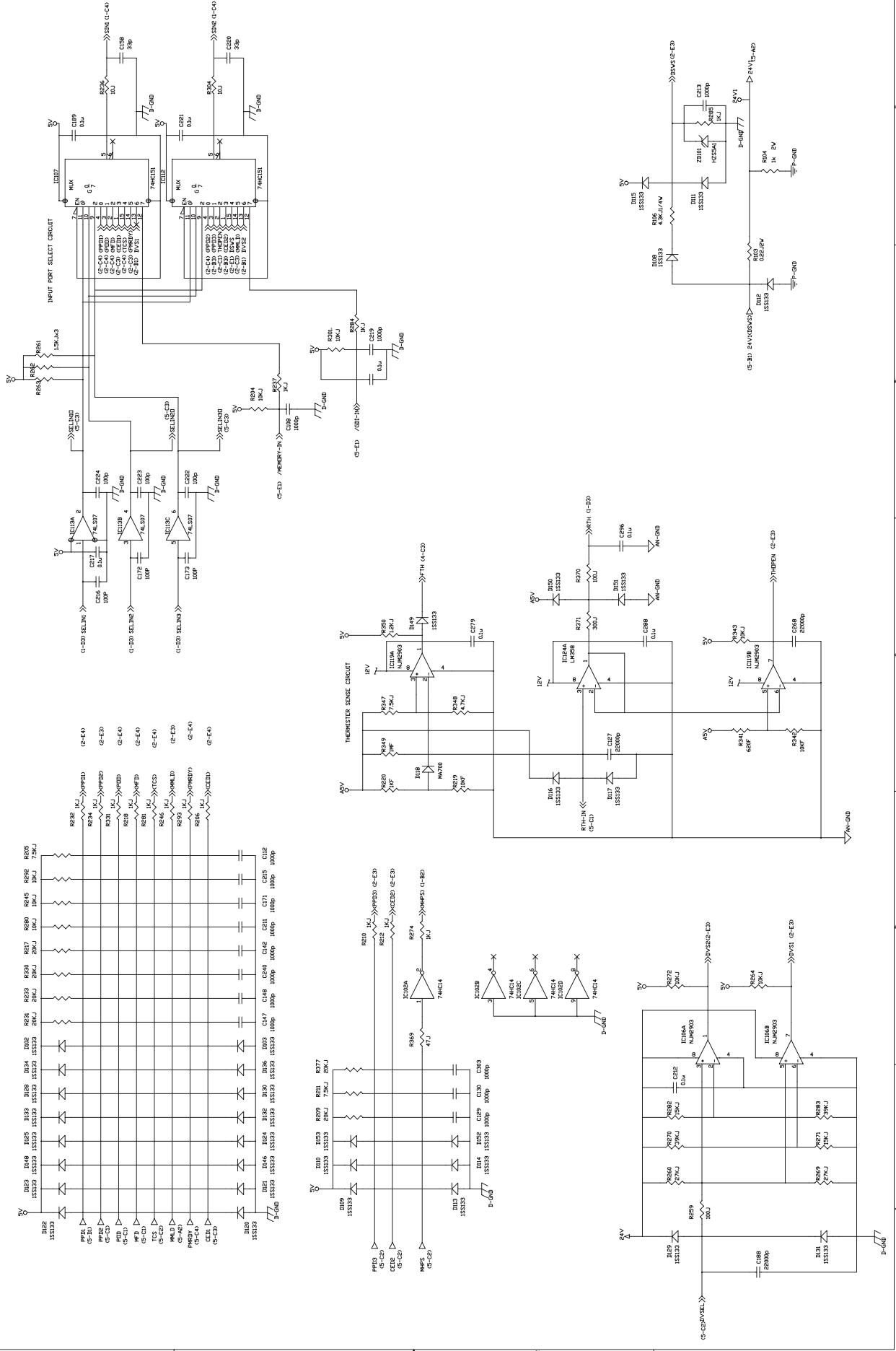
The display is controlled by inputting the data signal and the clock signal from the CPU and the latch signal from the ASIC to the LED driver in the operation circuit.



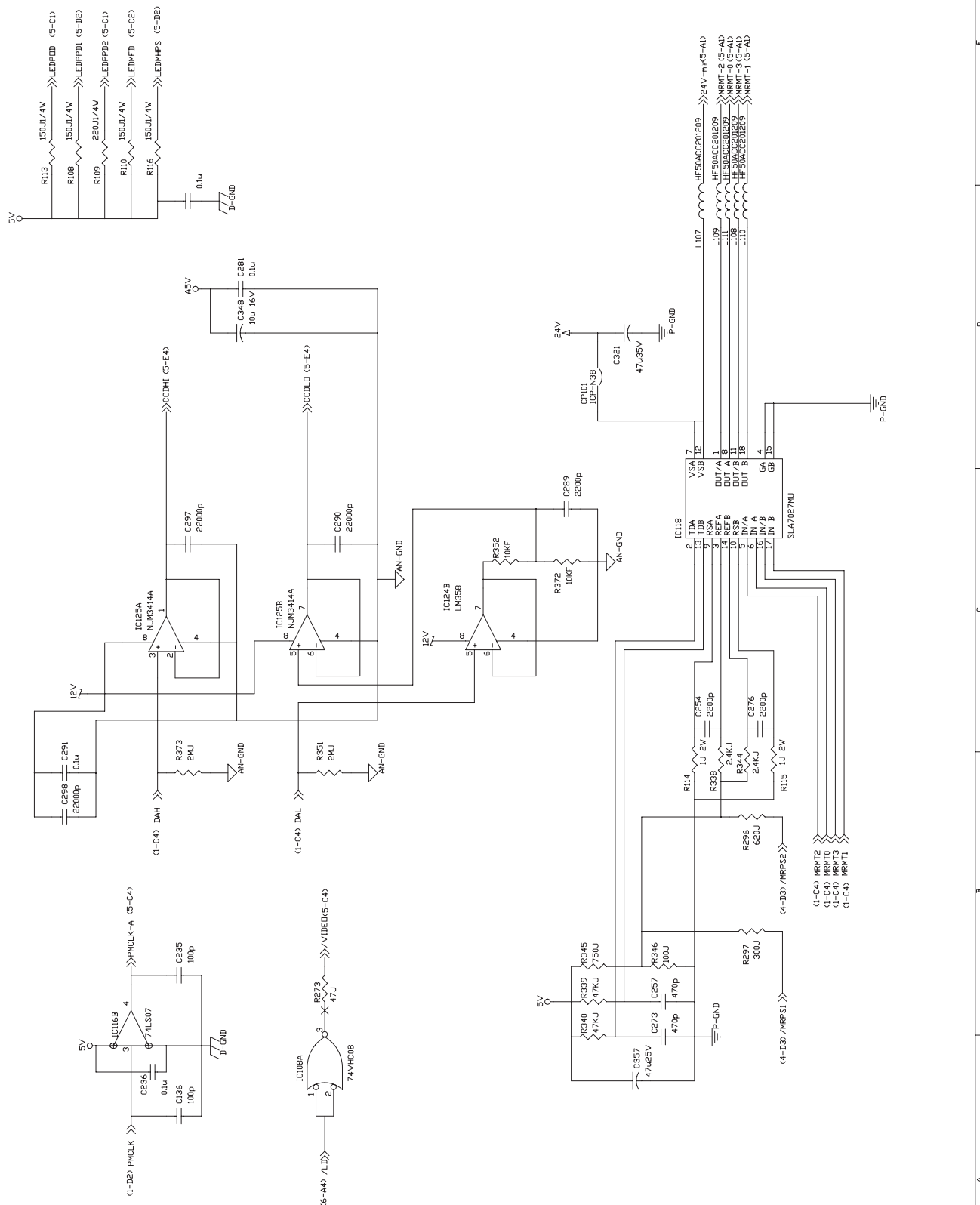
[13] CIRCUIT DIAGRAM





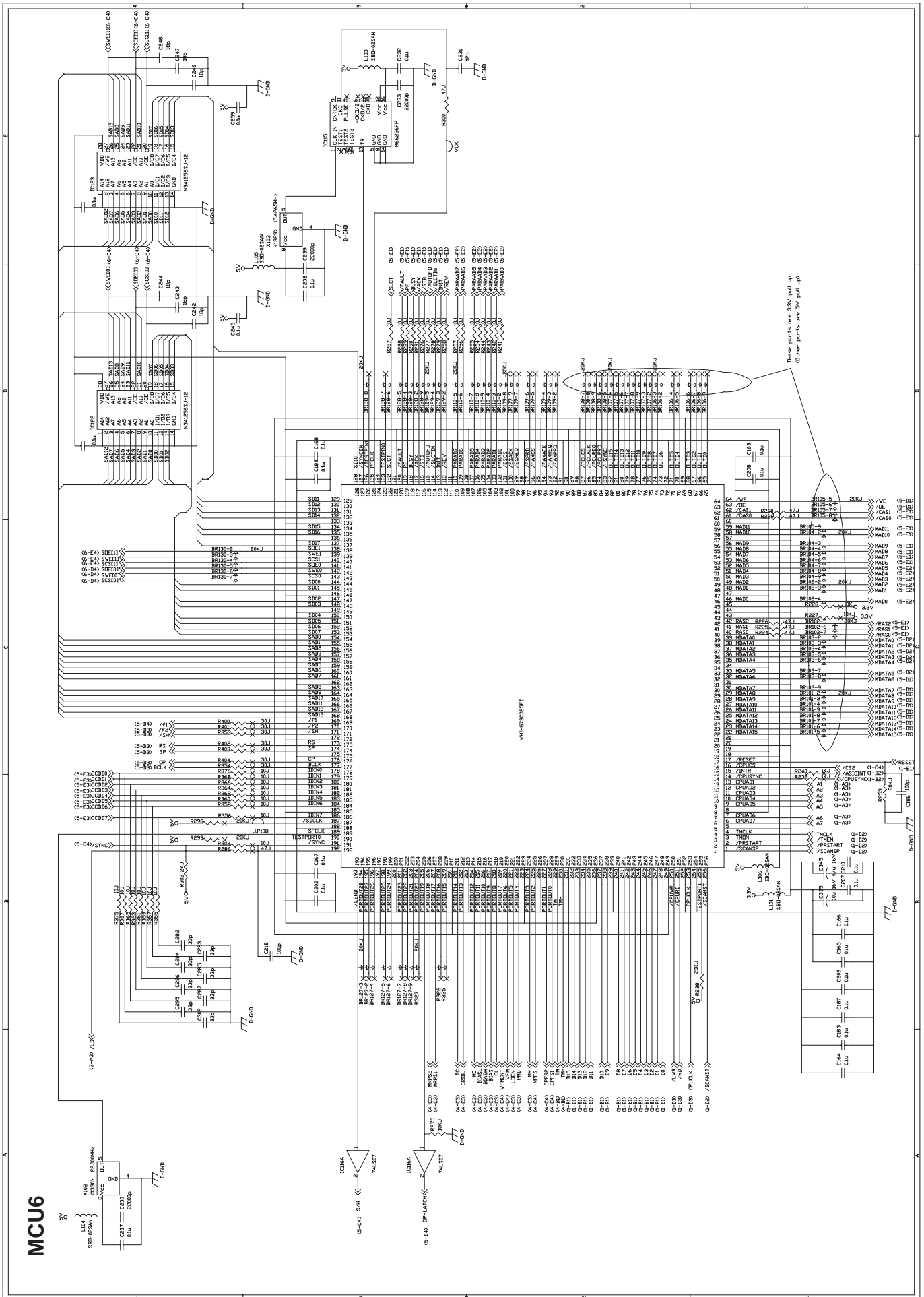


MCU3



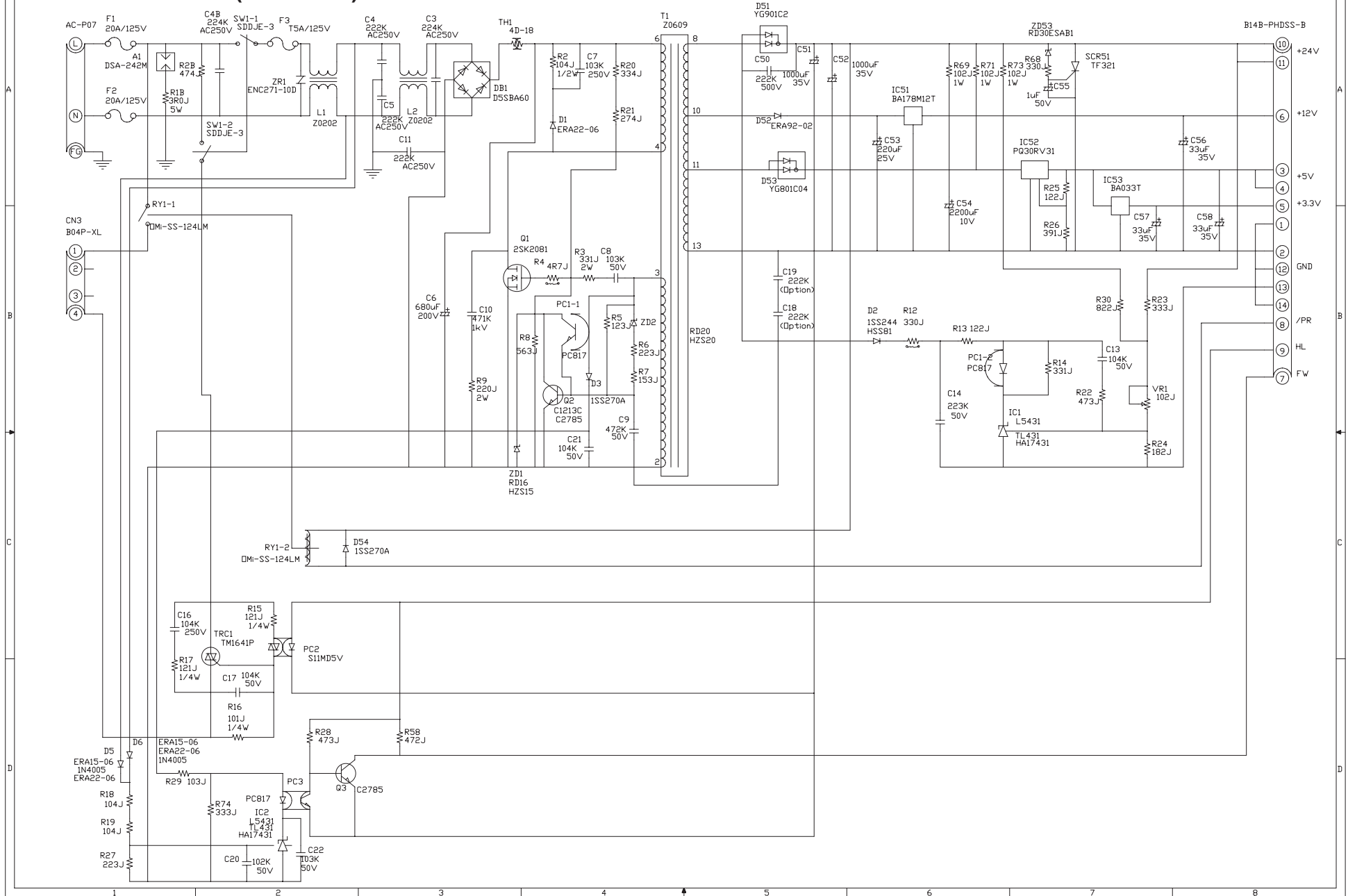




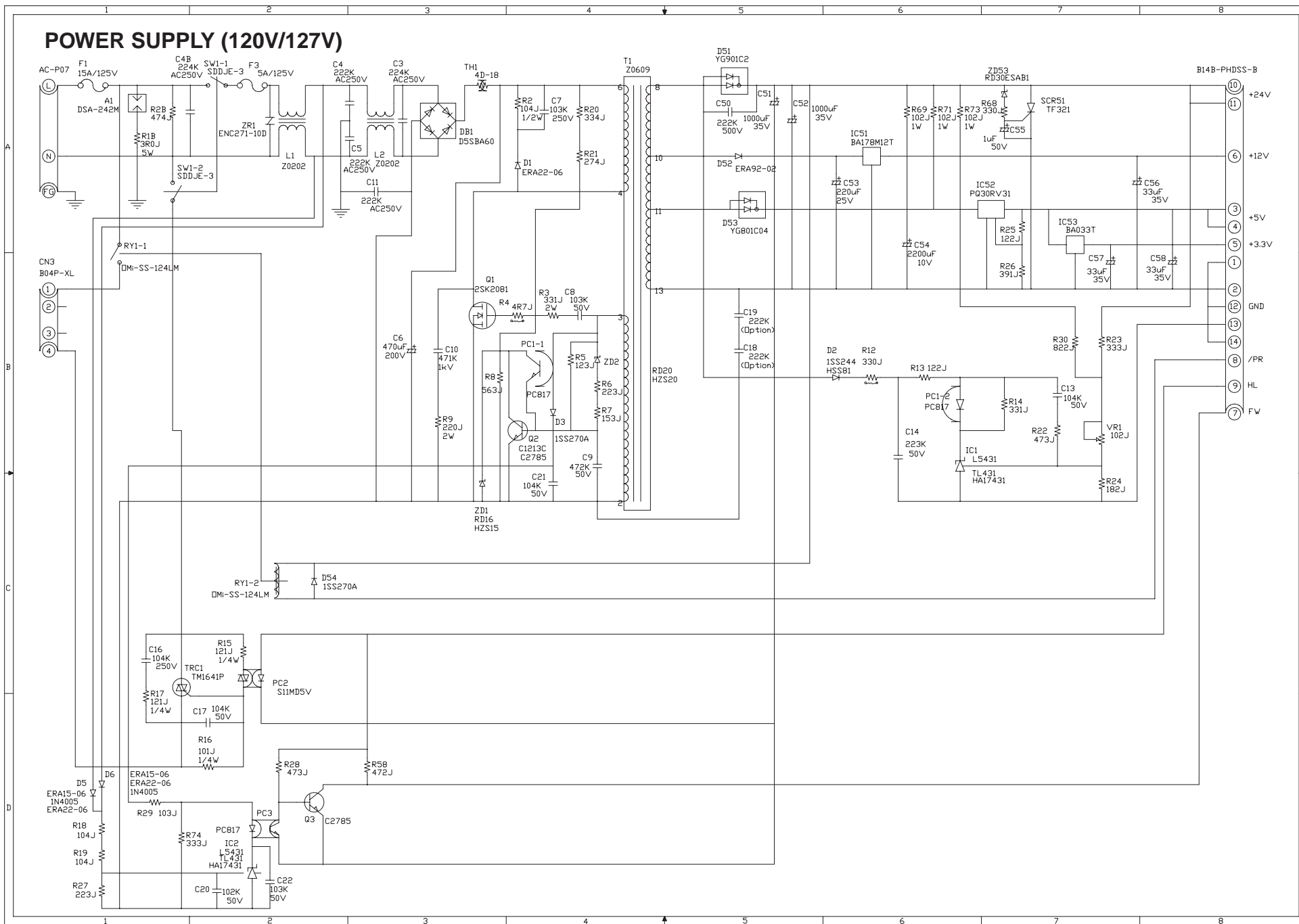


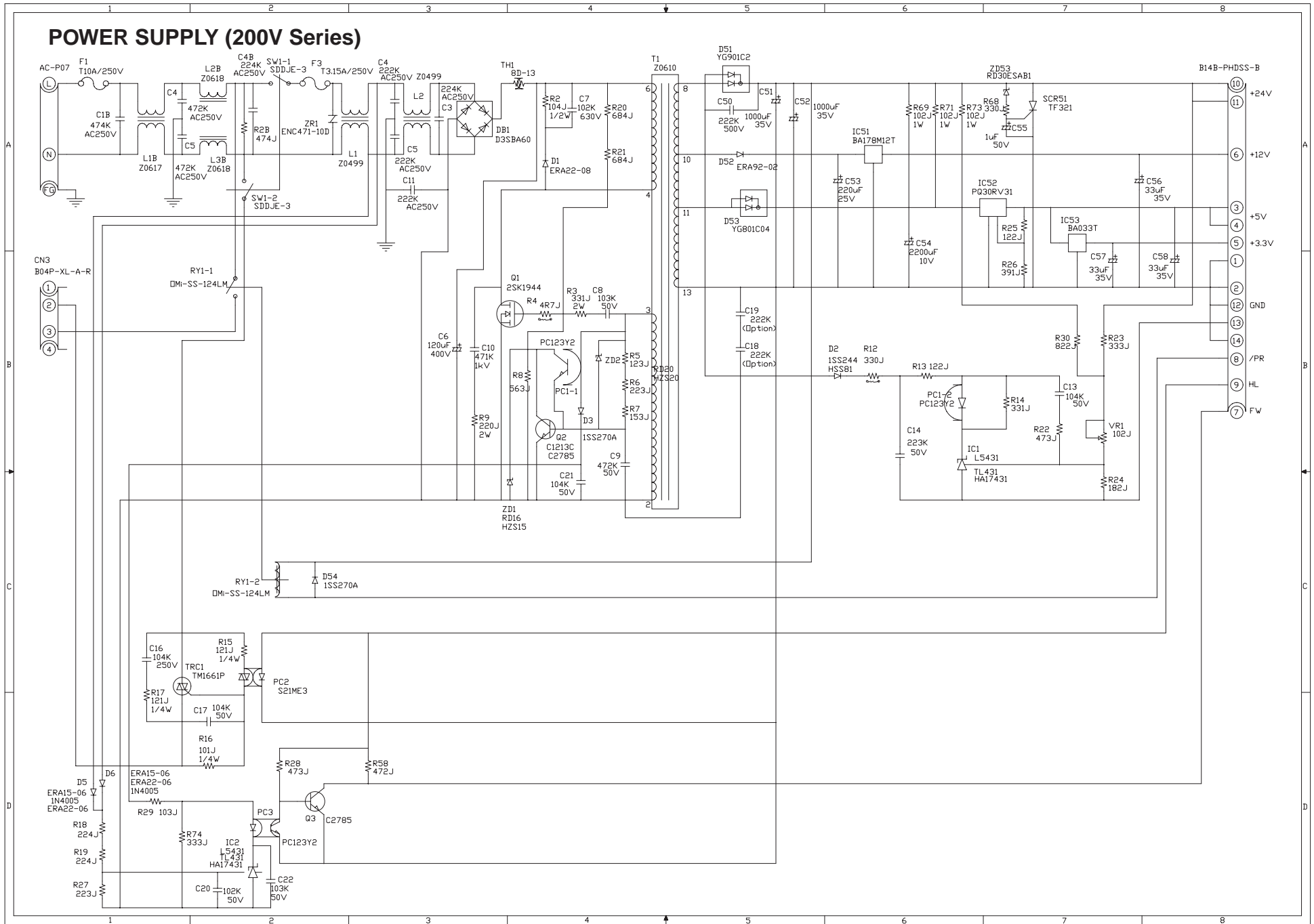


POWER SUPPLY (100V/110V)

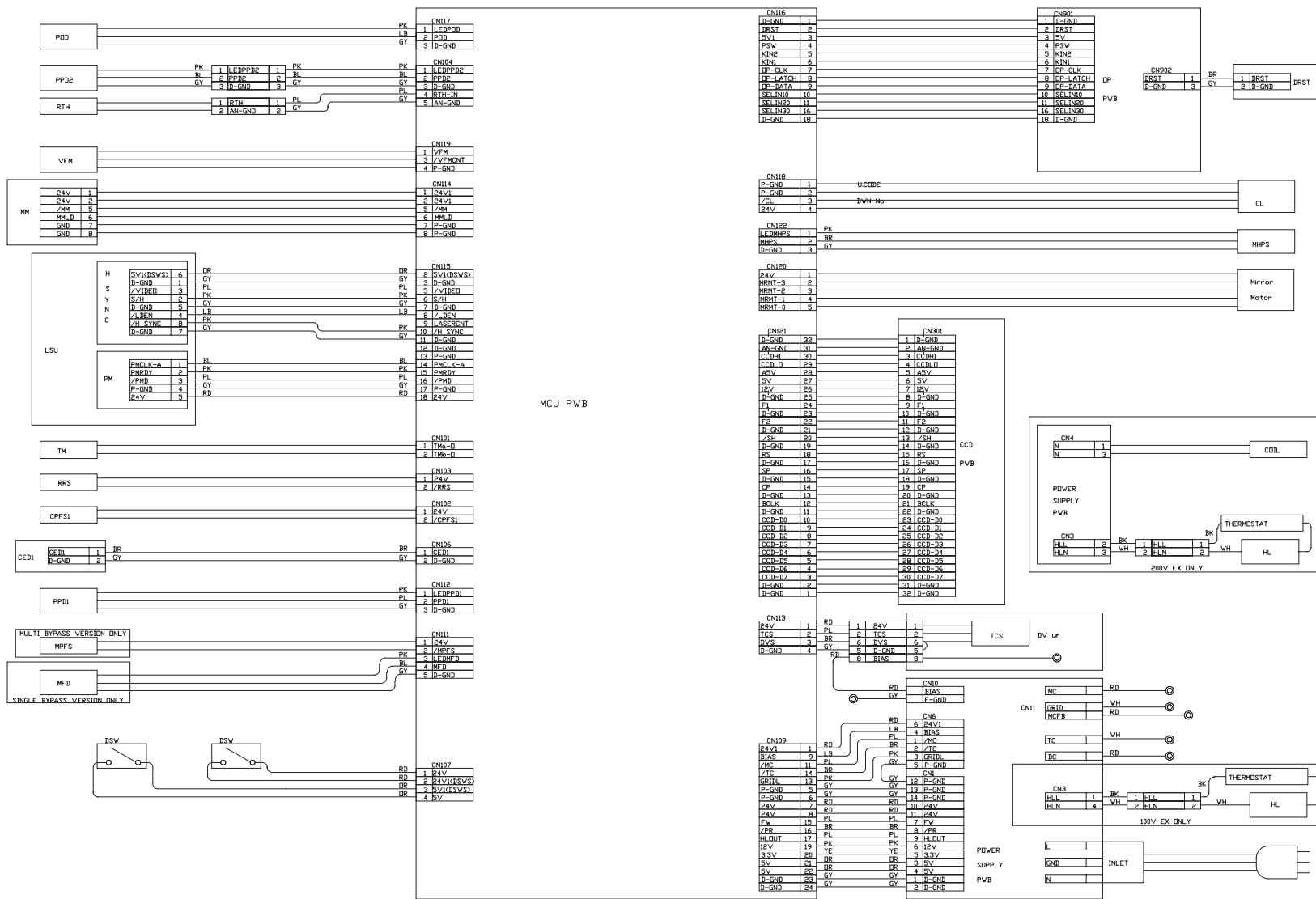


POWER SUPPLY (120V/127V)





ACTUAL WIRING DIAGRAM



SHARP

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